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MARCH 2022

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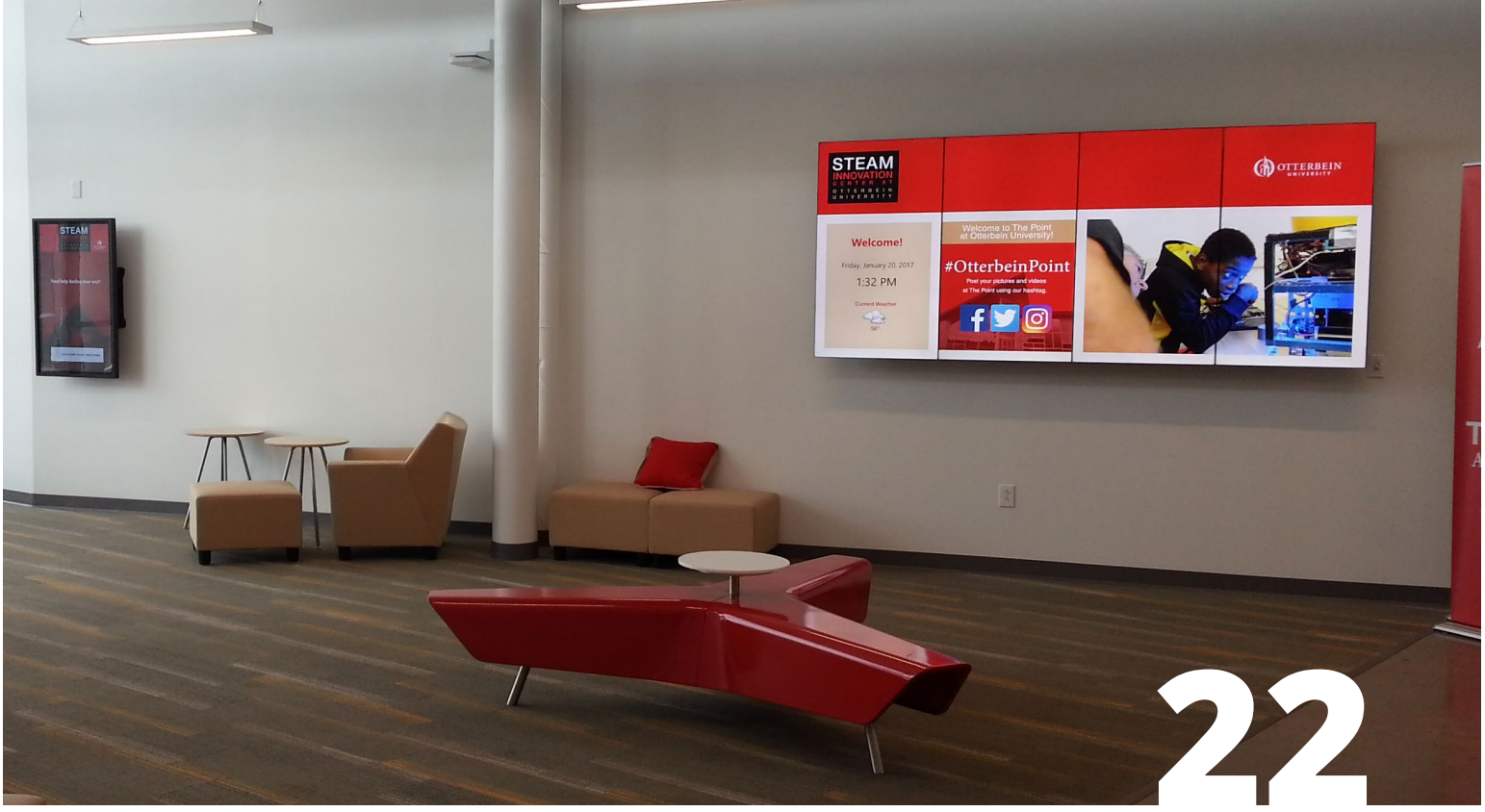

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EDITOR'S NOTE

HYJINKS AND HIGHER ED TECH

by Cindy Davis

THIS MONTH marked the second anniversary of the world being sent home to learn and work. I've been in touch with many of you throughout this time to understand your challenges, share your stories, and help celebrate your triumphs.

I had to laugh along with the story of one college after its campus was reopened: a HyFlex (the term was used loosely) model was adopted, allowing students who couldn't make it back to the campus yet to join remotely. And wouldn't you know—many students did join remotely, from the comfort of their on-campus dorm room. I learned that another college needed to put into place a "no remote learning while in bed" policy. Ah, students.

Hijinks aside, many educational teams learned that some classes could be conducted remotely just as effectively as they could in person—sometimes even more so. After all, in lecture halls seating 200 or more, students often have little interaction with the instructor or their peers to begin with.

We open this AV Technology Manager's Guide to Higher Ed AV/IT with a feature from someone who doesn't need an introduction. He recently delivered a keynote address at the WHERS Global Education Summit to "an esteemed group of attendees from the #UnitedNations, gov't policy makers, #HigherEd leaders, & acclaimed faculty." I've often said that I don't know how Joe Way gets any work done because he gives so much of his time to the industry and his peers in higher education—here in the US and around the world. And despite any hurdles, he always manages to have fun along the way, and is always quick to give credit to his amazing team.

Seven AV/IT teams from higher education are featured in this issue. And because I always appreciated being able to turn in my assignment late and still have it count, watch for several more to appear online at AVnetwork.com in April.

We also spoke with 39 industry experts from manufacturers and solution providers on the cutting edge of higher education AV to share their insight into how AV/IT managers can design for now and the future.

And finally, we shine a spotlight on 14 case studies that feature innovative AV/IT technologies paving the way for the classroom of tomorrow.

I WOULD LOVE TO HEAR FROM YOU

By illuminating the stories of AV/IT managers and technology stakeholders, as well as exploring the innovations of our industry's manufacturers and solution providers, we hope the AV Technology Manager's Guides become your go-to resource throughout the year.

AV Technology is your forum. Please drop me a line at cindy.davis@futurenet.com and tell me about your latest AV/IT project. Nominate a tech manager for a profile.

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AV/IT TEAM

Aligning Aesthetics, Architecture, and Audiovisuals

As part of their digital transformation, the University of Southern California sought to rethink the educational technologies across the enterprise, transitioning from legacy “black box” AV to network-based and UC-enabled offerings.

By Joe Way. PhD, CTS

The USC AV/IT team had to get creative when it came to Mudd Hall. They reused the same holes from old speaker yokes for new AtlasIED ALA line arrays to avoid having to submit for new permitting with the city.

Photos: Courtesy Crestron

While the beauty and grandeur of traditional college campuses make for perfectly posed graduation photos and homecoming memories, they present a distinct challenge for technology managers attempting to upgrade their spaces to the latest technologies.

As part of their digital transformation, the University of Southern California sought to rethink the educational technologies across the enterprise, transitioning from legacy "black box" AV to network-based and UC-enabled offerings. Installation went flawlessly until the AV/IT team encountered two buildings: Los Angeles historical landmarks, Doheny Memorial Library and Mudd Hall of Philosophy.

"When it came to these two buildings, we had four classrooms, one large auditorium, two lecture halls, a faculty training center, and an executive conference room to upgrade. As a team we all agreed to one non-negotiable: The buildings' beauty and majesty must take priority," declared **Joe Way**, PhD, director of learning environments. "The technology must disappear, but the quality cannot be sacrificed." This meant ensuring the campus standard of Crestron Flex, Shure MXA, Huddly and AVer cameras, Panasonic projectors, DTEN displays, and their signature custom credenzas by Heckler Design must be integrated as appropriate. USC's mantra of "standardized by default, custom by exception," was going to be challenged. "We had to get creative. For example, in Mudd Hall, we reused the same holes from old speaker yokes for new AtlasIED ALA line arrays to avoid having to submit for new permitting with the city. We carved out unused air handler returns to house the main auditorium's projector, modified an antique hutch to mount a DTEN for a conference room display, and even snaked custom-color network cables with double-stick tape alongside

At aut aut que dionecum, ommo blabo. Nempore-pudae doloribusa volest a velia cus est unt. Dae nulparibero incil-laudae autemquis et et

(*BELOW top, down*)
Lex Peters, learning environments CX/UX designer

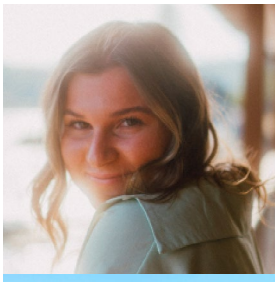
Raj Singh, manager, AV/IT design and engineering

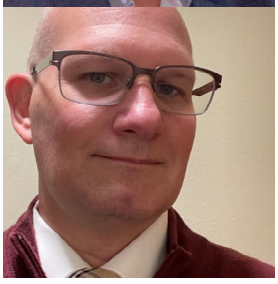
Joe Way, PhD, director of learning environments

the borders of hand-painted murals—because placing a screw and j-hook into the open ceiling plaster would both be against code and demolish the beautiful aesthetic."

Lex Peters, learning environments CX/UX designer, noted, "Ultimately, it is important to work in harmony with your university's rich history. It's not about having the flashiest technology but creating technology that will enhance the space instead of pulling away focus from it." The team recognized natural aspects to each spaces' architecture that would allow for the technology to blend in as if the century-old buildings were designed and built with the AV already in mind. An example of this is the faculty training room. Custom display sizes were fit into archways, a 40-foot-long by 9-inch-deep custom wood cabinet was built along the main wall just to house the technology vertically, six Shure MXA 710's on thin vertical columns were used to get proper coverage, and the team even built the main 20,000-lumen projector into a coffee table.

From an engineering and systems design standpoint, USC's focus on AV over IP was essential. Rather than worrying about running power, control, and content cabling for each device, a POE device could connect the system together





with just one simple Cat-6 cable. **Raj Singh**, manager, AV/IT design and engineering explained, "The older the building, the harder it is to integrate the technology because you cannot just snake through drywall that isn't there. Concrete, brick, and etched stone present challenges." Singh added, "Our emphasis on cloud, server, and IT-based AV over traditional AV infrastructure and components allowed us to minimize and mitigate the aesthetic disruption." Crestron VC-4, XiO and Fusion Cloud, Dante audio, wireless sharing to cloud-based applications like Zoom, and custom programming allowed for the amount of AV in the rooms to be streamlined. "Once we could get the speakers, microphones, and projectors or displays in place, the remainder of the technology could be housed in only 2 RUs of space," said Singh.

"I believe the end result with the AV was better than before the upgrade," suggested Joe Way. "We cannot forget that what we do is an art form, and challenges like these remind us of that. That is when our teams can truly shine." With these new integrations into historic buildings, the University of Southern California is well prepared to continue its standard of excellence for another century to come.

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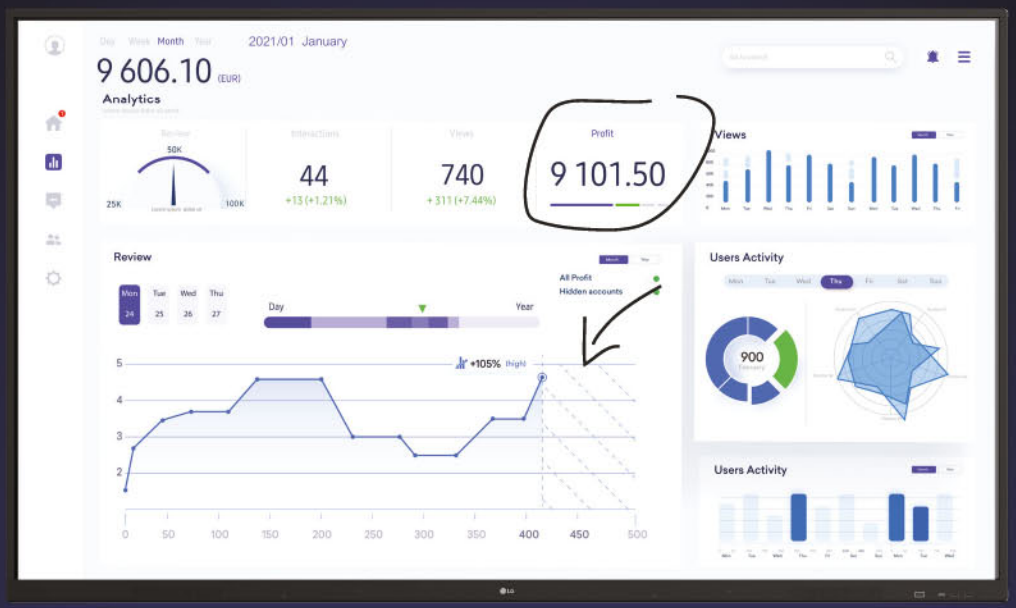

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AV/IT TEAM

Grand Valley State University

Photos: Kyle Macciomei

The goal was to create pilot active learning classrooms with flexible furniture and advanced technologies supporting remote learning.

GOALS: Through our Digital Transformation Strategy, our division will collaborate to enhance and extend GVSU's academic, research, and collegiate experience through new opportunities, modern services, innovative approaches, and supporting technologies. One of our three areas of focus is accelerating transformation through innovation. That transformation includes establishing the next-generation classroom. The goal was to create pilot active learning classrooms with flexible furniture and advanced technologies supporting remote learning.

CHALLENGES: The biggest obstacle was procurement of equipment. The ongoing pandemic has had a major impact on the supply chain for AV components. I had to make a few modifications to the design simply based on what equipment I could get at the time. The challenge was maintaining the designed functionality. The relationships I have between integrators and manufacturers were important. I was able to substitute demo components until my order was filled. In higher education, timelines are critical. Our classrooms are heavily used during fall and winter semesters, so we have a limited amount of time to complete projects. Designing an AV system that can provide equitable remote learning is a challenge in itself. Students connecting remotely need to see and hear what's going on in the space; and we need to provide video and audio communication not only between faculty and students connecting remotely, but student to student as well. With two-way communication, active echo cancellation (AEC) is critical. Because the classrooms were piloting new technology, I wanted to design them to be easily scalable and maintainable. I therefore chose hardware that didn't require advanced audio digital signal processor (DSP) programming. Additionally, the new furniture in the classroom is portable and can be configured and arranged for different teaching styles, so the technology had to be flexible as well. And so it's important to have auto-tracking cameras as well as manual PTZ control, and an auto-switching microphone array.

USER BENEFITS: I wanted the system to be as easy to use as possible and require minimal work from our faculty. There is little time at the beginning of class for faculty to prepare, and they should be focused on instruction and not technology. And so with our upgraded system, when a faculty member walks into the room, the microphone is already on and working, and the auto-tracking camera sets the shot without any user interaction; that includes removing unused playback and recording devices in Windows so the correct camera and microphone are selected automatically and require no additional Zoom or other unified communication platform setting changes. Each projector can be turned off and routed individually to meet the specific needs of each faculty member, and allows use of whiteboards behind projector screens. I utilized both display outputs from the PC so faculty can use an extended desktop to increase screen real estate, which is important when using Zoom and other software.

THE AV/IT TEAM: **Audrey Reenders-Arens**, electronic services engineer

COMPLETED: October 2021

TECH SNAPSHOT: Extron Matrix switcher/processor combination, 7-inch touch panel with BYOD connections, Shure MXA910 microphone array, Shure ANI22 Dante audio network interface, Extron MediaPort USB bridge, 1Beyond AutoTracker 3, 1Beyond PTZ IP-20, document camera, Extron 8-inch 180W ceiling speakers, Epson PowerLite L400U

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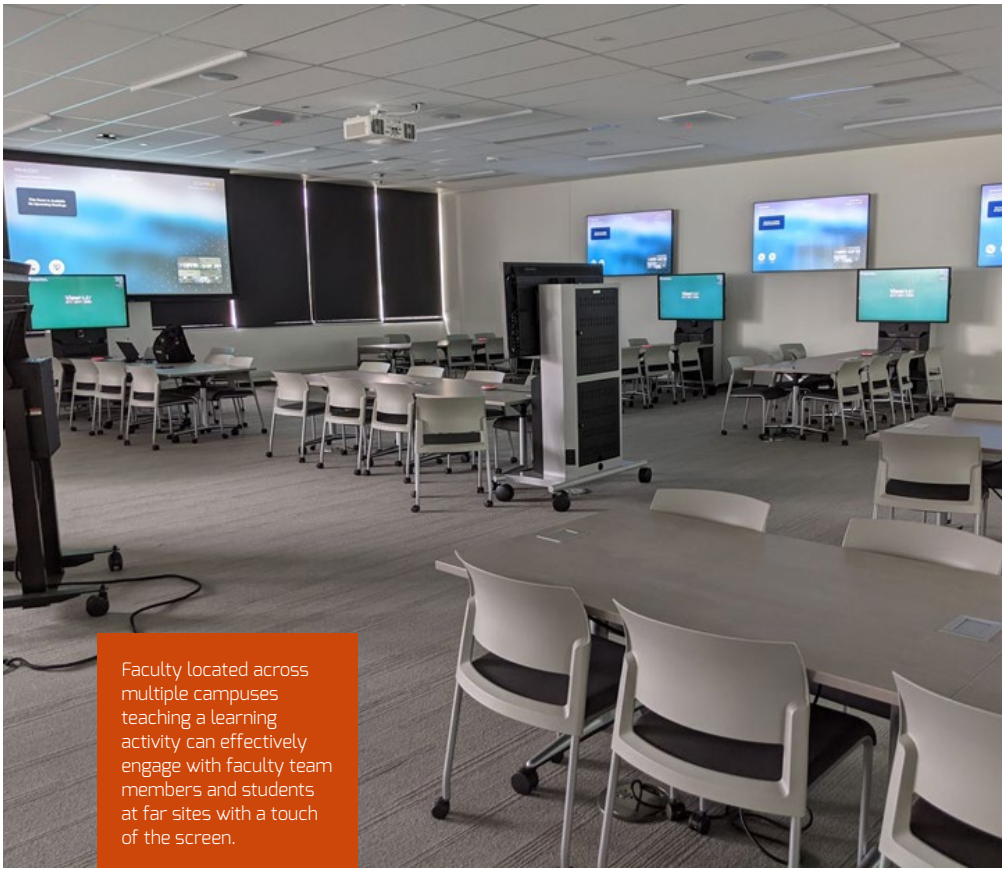
AV/IT TEAM

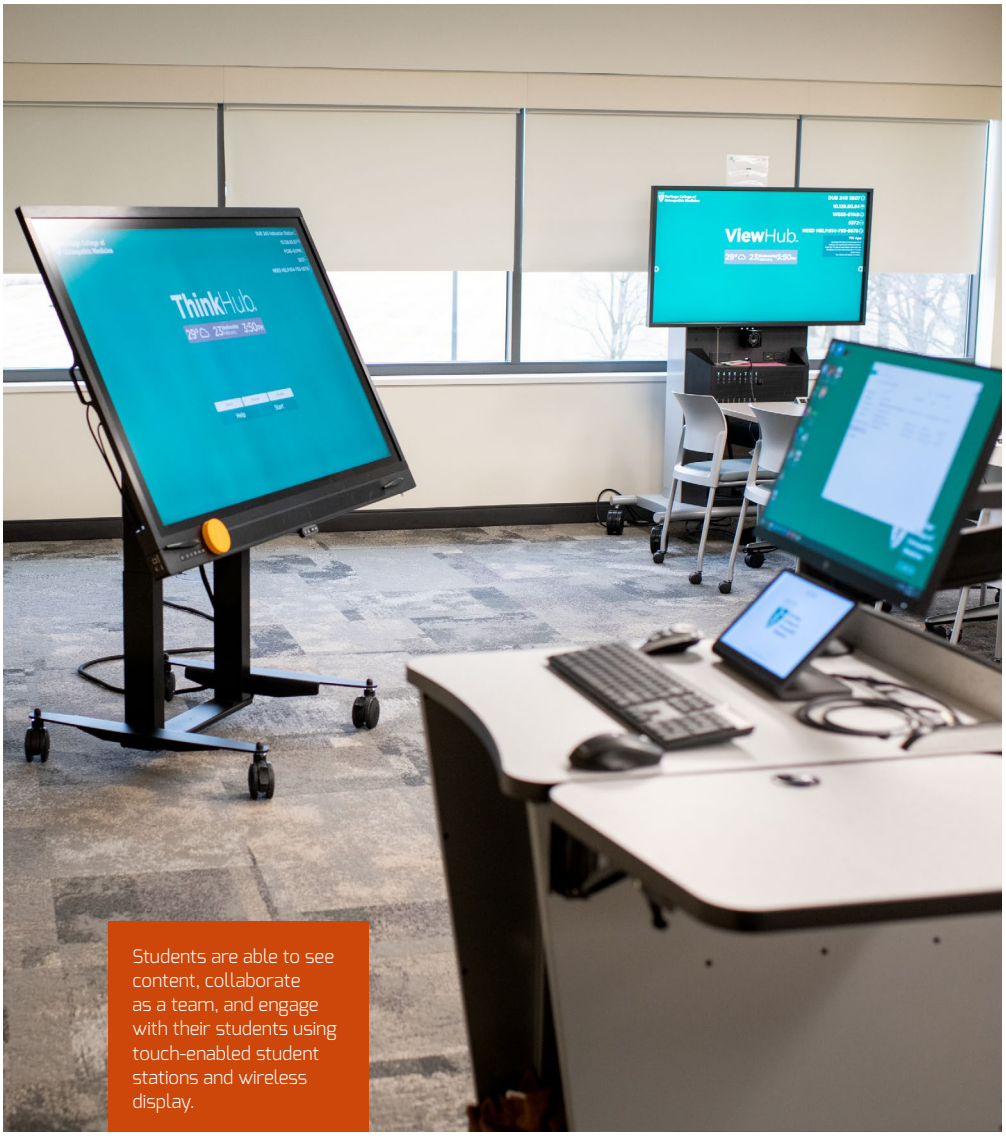
Ohio University Heritage College of Osteopathic Medicine, the Heritage College

GOALS: Three years ago, OU HCOM began the design of a new $65 million medical education facility in Athens, Ohio. Among the design drivers for the project, technology played a critical role in supporting overall flexibility of learning environments and connectivity to other campuses and the broader community. The new medical education facility provided an opportunity to re-envision technology to meet the future needs of medical education. The Heritage College had expanded its academic campuses to Cleveland and Dublin, which resulted in an active learning curriculum highly dependent on the use of technology to seamlessly connect three campuses for one learning activity. The Heritage College Technology team focused its efforts on creating a multi-campus, multi-site, hybrid learning environment—connecting students across the State of Ohio and enabling team teaching, collaboration, and optimal faculty/student engagement.



Faculty located across multiple campuses teaching a learning activity can effectively engage with faculty team members and students at far sites with a touch of the screen.

The Heritage College OMET Team is led by Jodie Penrod, senior director of technology.



Students are able to see content, collaborate as a team, and engage with their students using touch-enabled student stations and wireless display.

CHALLENGES: One of our greatest challenges with this project was implementing leading-edge technology to control our multi-campus environment: T1V's ThinkHub Education and ThinkHub Multisite. The Heritage College was the first higher education organization to implement this level of functionality for optimal faculty/student engagement across multiple sites. Additionally, engagement of our faculty in training and understanding the technology proved to be a risk. However, with the help of our technology partners, T1V and ROOT Integrated Systems, we were able to successfully launch the new technology in fall 2021 with no major issues and with an over 80 percent training rate of teaching faculty.

USER BENEFITS: There are many benefits to the design of this new learning environment for the Heritage College. First, the team-teaching approach has significantly improved with the use of ThinkHub Multisite. Faculty located across multiple campuses teaching a learning activity can effectively engage with faculty team members and students at far sites with a touch of the screen. Additionally, the faculty have more flexibility in the delivery of content and interaction with students. With the onset of the pandemic, the use of the new technology has further prepared the Heritage College to provide a hybrid learning experience that is equitable for both classroom-based and remote students. Students are also able to see content, collaborate as a team, and engage with their students using touch-enabled student stations and wireless display. Student content can also be shared with the entire classroom, or the entire learning environment, throughout the classrooms in Athens, Cleveland, and Dublin.

THE AV/IT TEAM: The Heritage College of Osteopathic Medicine Office of Medical Education Technology (OMET), along with our partners at T1V, Inc. and ROOT Integrated Systems were responsible for the planning, design, and implementation of this project. The Heritage College OMET Team is led by **Jodie Penrod**, senior director of technology.

The following individuals were also part of this project: **Eric Clift**, assistant director, technology and telehealth operations; **Phil Swatzel**, senior technology infrastructure engineer; **Frank Carano**, senior classroom technology specialist; **Jessica Makosky**, classroom connectivity manager; **Joe Scowden**, learning technologies specialist; **Mark Loudin**, learning technologies analyst; **Cory Lewis**, technology support manager (Athens); **Janet Dearth**, learning technologies analyst; **Josh Jones**, learning technologies analyst; **Mike Wolanin**, technology support manager (Cleveland); **Dave Eggler**, IT support specialist (Cleveland); **Chan Chanthapanya**, IT support specialist (Cleveland); **Rick Burke**, technology support manager (Dublin); **Paul Becerra**, IT support specialist (Dublin); **Evan Amerio**, IT support specialist (Dublin)

COMPLETED: August 2021

TECH SNAPSHOT: T1V's ThinkHub Education and ThinkHub Multisite

AV/IT TEAM

University of Guelph, Classroom Technical Support

GOALS: We believed that because of COVID-19 restrictions, not all students would return to face-to-face learning immediately when the campus reopened. In the face of this, we felt it would be necessary to implement synchronous online and hybrid teaching technology in our classrooms.

CHALLENGES: The University of Guelph has a BYOD model in our classrooms with no classroom computers. Professors bring in a plethora of different laptops—from economical, consumer-grade laptops to high-end production workstations. Our challenge was to install classroom web conferencing with easy connection.

Our classrooms were well equipped and well liked by professors, and we did not want to break that good working relationship by radically changing the technology. The web conference functionality needed to be added to the classroom technology package in a way that allowed the rooms to still be used as they were pre-COVID-19.

During the initial COVID-19 pivot we converted some seminar rooms to simple lecture studios using a laptop docking station, an extra monitor, a webcam, and a USB document camera. These were to accommodate professors who did not have a home or office environment conducive to teaching. We leveraged the knowledge gained from this to plan web conference lecture theaters for the fall 2020 semester, which would include a PTZ camera, AV bridge, and a tie into the room wireless mic and sound system. Unfortunately, due to supply delays, we had to reuse our simple lecture studio model and apply it to lecture theaters for the fall semester.

The delayed equipment arrived for winter 2021. At that time, we did further equipment testing, worked with our Instructional Design team, and leveraged the experience gained in the three rounds of equipment installation so far.

In our final iteration, we focused on two designs: hybrid lecture concentrated on delivering the professor's content to both in-class and remote students simultaneously; hybrid seminar would allow for synchronous discussions to occur between the in-classroom professor, in-classroom students, and remote students.

USER BENEFITS: Our hybrid lecture theaters use a professor-facing PTZ camera, AV bridge, HDMI-to-USB capture for presentation sources, laptop docking station, monitor on the teaching station, and tie-in to the classroom sound system and AV system. The AV bridge handles the conference video and audio.

Christopher Hewitt (left), manager, classroom technical infrastructure; Steve Borho, manager, classroom design and planning

The HDMI-to-USB capture scrapes the presentation going to the projector, allowing any source shown on the screen to be shared in the web conference as the presentation source. Doing it this way allows for easy switching of the presentation source using the classroom touch panel.

The monitor provides the extra display often necessary to view the conference software while using PowerPoint during a web conference. The laptop docking station consolidates the camera, HDMI capture, sound, and displays into one USB connection for the professor's laptop.

Our hybrid seminar classrooms have the same equipment, adding a student-facing PTZ camera and a full-room microphone system. The mic allows for all students in the classroom to be heard in the web conference, enabling discussions between the professor, in-class, and remote students.

Teaching and learning tasks supported in the hybrid seminar classrooms include lecture/student presentations, individual work, small group work, group presentations, and full-class hybrid discussions.

The average equipment cost of web conferencing for each room was just under $10k. Installation was completed by our in-house AV personnel, a small team that worked extremely hard. With our touch-panel programming being done in house it allowed us to nimbly make a user interface that was simple and easy to use, such that professors did not have to worry about the technology and could just concentrate on delivering content. A successful installation in 40 classrooms was achieved in six months flat, resulting in a great end user experience.

THE AV/IT TEAM: **Christopher Hewitt**, manager, classroom technical infrastructure; **Steve Borho**, manager, classroom design and planning; **Joe Mignacca**, computer communications analyst; **Christopher Young**, electronics specialist; **Ross Gilles**, **Frank Ridder**, **Shelley Vance**, **Jonathan Van Hoffen**, multi-media information technology specialists

COMPLETED: August 2021

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AV/IT TEAM

University of Massachusetts Lowell

These spaces are not your typical classrooms. We strongly suggested training and curriculum modifications for the faculty who teach in these rooms.

GOALS: Our goal was to create reliable TEAL (Technology Enhanced Active Learning) spaces on campus to promote collaboration between students in a dynamic classroom environment.

CHALLENGES: All the spaces were new building projects, which helped to create a unique room configuration layout and premise wiring. We wanted the classrooms to be software centric and to not have an abundance of hardware and wired infrastructure for switching and distribution. The biggest hurdle was identifying the correct solution—one that relied on wireless connectivity for students; was device agnostic; and provided on-screen, intuitive controls for the instructor. Two solutions were identified and implemented. In the Olsen Sciences building, Sony Vision Exchange was the selected solution, as it provided a better solution for whiteboard sharing and snapshots.

In Coburn Hall, primarily social sciences and education, the WolfVision vSolution platform was installed. This allowed for easier iPad and Chromebook integrations. In both spaces, students leverage the university's wireless infrastructure to connect to the student "pods." Each pod is connected to a large-format interactive-touch flatscreen. The student pods

Students have no problem connecting to the pods and sharing content because of the easy-to-use and intuitive connection process.

are clustered around the perimeter of the room and accommodate six students each. The Instructional Technology Services team worked closely with the IT Networking team to open the appropriate ports and configure firewalls for seamless connectivity. One hurdle was to overcome the multicast restrictions of the network. Both the Instructional Technology and Networking teams were able to get creative and provide a workable solution to get these classrooms configured. This turned out to be a very good example of cross collaboration within IT.

USER BENEFITS: These spaces are not your typical classrooms. We strongly suggested training and curriculum modifications for the faculty who teach in these rooms. We offered formal training to groups of folks who were interested in teaching in the spaces. During these training sessions, we not only covered technology features of the rooms, but what type of group learning activities are ideally suited for this type of technology. These rooms were already installed for about a year before the COVID-19 pandemic put a crimp on in-class course delivery.

Over the past semester, we have returned to a more normal environment, and activity in these spaces is now at pre-pandemic levels. Faculty need to request being scheduled in these spaces prior to the semester with the registrar's office. We have streamlined this process with a web request form. Once faculty have used the room for a semester, they are eager to get scheduled in the spaces again. Demand is to a point where we are planning to double the number of TEAL spaces on campus in the next couple of years. The reliability of the equipment, dynamic course delivery options, and ease of use have made these spaces a huge success. Students have no problem connecting to the pods and sharing content because of the easy-to-use and intuitive connection process.

THE AV/IT TEAM: This integration was a true team effort, from installing technology, coordinating installation, engaging the Networking team, evaluating and testing platforms, and training end users—both students and faculty. The team included: **Robert Coppenrath**, senior instructional technologist; **David Corcoran**, instructional technologist; **Bill Suppa**, manager, instructional technology services; **Jon Kleiner**, instructional technologist; **David Hadley**, senior classroom technician; **Andy Alfano**, principal classroom technician; **Tom Robbins**, classroom technician; **Matt Gordon**, senior instructional technologist; **Michael Lucas**, senior director of instructional technology

COMPLETED: January 2020

TECH SNAPSHOT: Sony Vision Exchange, WolfVision vSolution, Echo360 video platform, Viewsonic multi-touch 65-inch and 85-inch interactive flatscreens

AV/IT TEAM

University of North Carolina Wilmington, Upperman African American Cultural Center

GOALS: This past winter, the University of North Carolina Wilmington performed massive renovations of the Upperman African American Cultural Center, giving it expanded space and new AV solutions to better serve the African American student population on campus. The AV design was led in house by UNCW's Integrated Educational Technologies team. The team's vision for the space was a multi-functional system that could facilitate student collaboration and learning, virtual conferencing, and social gatherings.

CHALLENGES: The design presented some unique challenges beyond the normal educational space. Before the expansion, Upperman had a single large-screen display in their main space with an HDMI connection and USB port, and this upfit represented a significant leap forward in available technology in the space. The designer, **Richard Blaylock,** wanted to make sure the space would have technology it would use, so there were several meetings with **Sean Palmer**, the center's director, to inform on recommendations. The system needed to have discrete controls in

The space now has four zones, each with a flat panel display and ceiling speakers.

The space now has four zones, each with a flat panel display and ceiling speakers. These spaces are a video-conferencing room, an art gallery, a library, and "the living room."

each of four spaces, while still being one unified system that could be controlled from a central touch panel.

With the system needs in place, UNCW settled on using a traditional point-to-point video matrix and central DSP. An AV-over-IP system was considered, but for the scope of the project, the fixed-architecture matrix switch better matched the need.

USER BENEFITS: The space now has four zones, each with a flat panel display and ceiling speakers. These spaces are a video-conferencing room, an art gallery, a library, and "the living room," which is for events and general student use. When not being actively used, the displays show digital signage, but, using local control points, can be swapped over to wireless collaboration units, wall input plates, or a micro-PC connected to the conferencing system. From the conference room touch panel, any input can be routed to any of the output zones using a simple-selection GUI with robust feedback.

A final function that has been planned for a future installation is a media conversion and playback system. Upperman owns an extensive library of rare media, such as out-of-print records, speeches, news and television broadcasts, and other cultural and historic media. To preserve this, a recording and playback system was designed that would allow Upperman staff to digitize the media, and then for students to use a touch panel interface that would recall and play the media on a designated display in the space.

COMPLETED: February 2022

TECH SNAPSHOT: Extron Crosspoint matrix switcher, Extron speakers and amplifiers, OneLAN digital signage solution, Mersive Solstice collaboration hubs, Biamp Tesira AVB DSP

AV/IT TEAM

University of Nevada, Las Vegas, Office of Information Technology, Classroom Technology Services

GOALS: In the midst of the COVID-19 pandemic, university provost Dr. Chris Heavy requested a "big, bold plan" that would help both faculty and students navigate a challenging learning environment, while providing lasting value to the university at large. The main goal was to provide a new solution in our classrooms while keeping the existing standards in place. Essentially, we added another flavor of classrooms to our classroom ecosystem.

The hybrid classroom design "RebelFlex" provides the equipment needed for both synchronous and asynchronous learning, which allows instructors to leverage enhanced technology in the classroom to teach a face-to-face class, and to students who are joining remotely simultaneously. Instructors can engage both sets of students in real time using Webex or similar technology, as well as capturing the content for remote viewing. Instructors can engage both audiences in a typical lecture scenario or by using active learning techniques, which may include class discussions, live polling, or group work.

To prepare for the roll-out, UNLV converted 73 classrooms into RebelFlex equipped spaces.

Photos: Rakitha Perera

The room has synchronous and asynchronous capabilities; recording capabilities; and live, "in-the-room" capabilities.

CHALLENGES: Yes, there were many challenges. First, we had just a few weeks to come up with a solid design and get the equipment ordered. As part of the design, we needed to select the rooms, provide a site survey, and finalize the equipment needed for the particular rooms selected. As every building is of different age and design, we had many architectural restrictions to consider in product selection. Once the design was approved and equipment was ordered, we then had to schedule the installation around classes that were to be held on campus. All of this was with the ongoing supply and shipping shortages.

USER BENEFITS: To prepare for the rollout, UNLV converted 73 classrooms into RebelFlex equipped spaces. It was what I like to call the Swiss army knife of classrooms, because while it is a typical classroom, we added lecture capture and web conferencing into the rooms. Now the room has synchronous and asynchronous capabilities; recording capabilities; and live, "in-the-room" capabilities. The room has everything.

Students are enrolled into two groups for a RebelFlex class: one group meets in the classroom for each scheduled session, while the other group joins remotely at the same time. Everyone interacts with the instructor and their classmates in real time using Webex or similar technology. The instructor can explore new teaching techniques while teaching both sets of students simultaneously. The students can enroll in the section that fits their learning style and engage in active learning together, in person or remotely.

THE AV/IT TEAM: The project was split into the "What" group, which was responsible for campus needs and ease the transition to a flexible model or provide options; and the "How" group, which was responsible for the design, implementation, and support after install.

The Classroom Technology Services and E-Learning Technology departments collaborated on the design, use, and support models of this project. It truly was a team effort. Key players included: **Frank Alaimo**, senior AV systems specialist and acting manager of CTS; **Michael Theil**, senior AV/IT control systems specialist; **Joseph Chrobak**, AV/IT systems specialist; **Matthew Broughton**, IT technician 6; **Rohan Palmer**, IT professional 2; **Andy Borts**, instructional technology support specialist, OIT e-learning technology; CCS Presentation Systems, Las Vegas

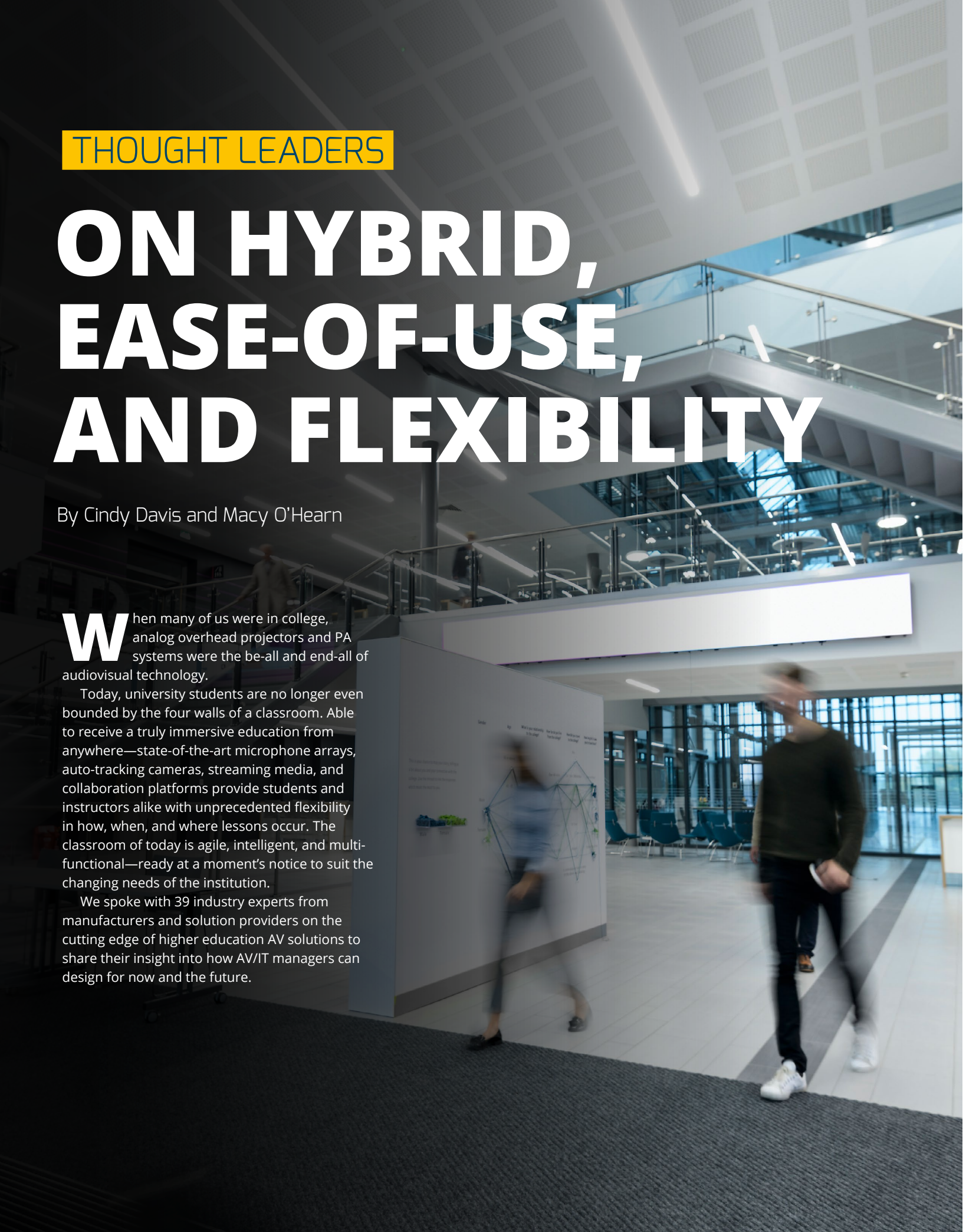
COMPLETED: Installation in 36 rooms was completed May 2021, and an additional 37 rooms were completed January 2022.

TECH SNAPSHOT: An audio DSP for multiple Sennheiser microphones (SpeechLine Digital [lapel] and TeamConnect Ceiling 2); Vaddio PTZ camera; Inogeni Share 2; Crestron 8x8 AV switcher, processor, and 10-inch touch panel; Panopto lecture capture; Webex

THOUGHT LEADERS

ON HYBRID, EASE-OF-USE, AND FLEXIBILITY

By Cindy Davis and Macy O'Hearn



Photograph: Getty Images

When many of us were in college, analog overhead projectors and PA systems were the be-all and end-all of audiovisual technology.

Today, university students are no longer even bounded by the four walls of a classroom. Able to receive a truly immersive education from anywhere—state-of-the-art microphone arrays, auto-tracking cameras, streaming media, and collaboration platforms provide students and instructors alike with unprecedented flexibility in how, when, and where lessons occur. The classroom of today is agile, intelligent, and multi-functional—ready at a moment's notice to suit the changing needs of the institution.

We spoke with 39 industry experts from manufacturers and solution providers on the cutting edge of higher education AV solutions to share their insight into how AV/IT managers can design for now and the future.

TERRENCE BOYD
Senior Business Manager
Sony Electronics

Now more than ever, designing a hybrid higher education environment is essential. The pandemic has made universities rethink their relationship with technology—providing faculty, staff, and students with unrivaled accessibility; accommodating their evolving needs; and accounting for ever-changing national health and safety guidelines.

In a higher education setting, ease of installation and ease of use often come to the forefront. Equipment needs to be set up expediently so that it doesn't interfere with instruction time, and it needs to be simple so that educators with varying levels of technical proficiency can operate the technology without a challenge.

Other important factors when selecting technology are flexibility and scalability, which help the technology to grow and adapt within your infrastructure as your needs change. This helps to secure your investment and allows you to be better prepared for the transformations that continue to take place in the education realm.

Another essential consideration when selecting technology is the ability to foster collaboration and engagement in real time. This can all be achieved in numerous ways, so it's important to have a strong understanding of the objectives, goals, and budget; a good sense of the space you're working in; as well as a grasp on the necessities versus the "wants" of the classroom refresh before it begins. It's also significant to consider whether the information will be presented live, recorded, or available on demand to help inform your technology needs.

As the education model continues to adapt, technology should be leveraged to ensure a quality educational experience, and to ensure that students are able to seamlessly interact with each other and their teacher, regardless of location.

JOHN HULEN
Director of Channel Marketing, Education
Crestron

I recently heard a really interesting comment from a contact of mine at West Point, the United States military academy: he told me that they have now decided that a cadet should be able to learn from wherever they are in the world.

It's a brilliant and concise way to look at the current situation, and it highlights a watershed moment for remote, hybrid, and HyFlex teaching and learning. Understanding how to accomplish that goal, however, is the key.

The first consideration is addressing just what kind of learning environments you're going to provide. Hybrid learning is a model which combines elements of face-to-face classroom instruction with online instruction. The benefits of hybrid learning are that students learn in a more engaging environment, and that students are not restricted to a certain time or place. HyFlex learning, on the other hand, is an approach that allows the student to decide how to interact with the course material. Each class session and learning activity is offered in-person, synchronously online, and asynchronously online.

Most schools are already accommodating one or both of these new learning methods. Since institutions are now learning to adapt to any situation, from a pandemic to inclement weather, it makes sense to be prepared for whatever's next. Additionally, different learners react in different ways to different situations; some students thrive when left to their own schedules, while others feel more comfortable when they can watch the content play back several times.

Maybe the biggest consideration, though, is to ensure the system you deploy can grow and change—a quality we call "future flexible." Crestron has created a Teaching and Learning Design Guide that delves into the specifics of creating a system that will work for your organization's support team and its end users.

JASON POLK
Marketing Coordinator
Absen

When it comes to education, the needs of students of today also impact the students of tomorrow. I remember in college taking what is now a virtual online class with video modules and assignments to do. Now with Zoom meetings being a staple of virtual learning through the pandemic, students have grown accustomed to being online for that experience. The need to be able to go virtual at a moment's notice is paramount to our teaching environment. AV/IT managers need to make sure that teachers are equipped with enough bandwidth to handle large amounts of students on a given call. Those pre-recorded lessons from yesteryear are now live, and that places a lot of stress on the IT infrastructure. Also, having classrooms filled with LED all-in-one solutions and smart technology will enhance the teacher's presentation, so that when the students are in class, those at home are able to still have the same experience.

The most important need, however, is accessibility to those resources. Many students through the pandemic didn't have the resources necessary to attend class due to socio-economic situations. Even an advanced society like ours still has those who are left behind. A solution would be for school districts to invest in acquiring and maintaining a cache of laptops with hotspots so that those who can't afford one are able to have the same learning experience as their peers. As we move forward, education is about learning from anywhere, and AV/IT managers play a big part in making that happen.

CARYS GREEN
Regional Sales Manager, Integrated Systems
Shure

Meaningful and value-added hybrid learning models are more crucial to the success of students and educators at learning institutions worldwide than ever before. The collaborative learning spaces of the future will be inherently equitable, inclusive, and accessible because of continued innovation in high-quality audio and AV technology. AV and IT decision makers today are tasked with the important responsibility of making the right investment decisions that will bolster the new era of hybrid education—a trend that research tells us will likely outlast the global pandemic. This investment benefits everyone: the organization, educators, and, most importantly, students.

The primary decision of AV and IT professionals should be to embrace flawless audio for remote and in-person students. If a video drops out mid-lecture, the lesson can likely continue verbally. Subtract audio at any point, however, and it is likely that only the in-person students will attain the full value of the class session.

Good quality audio is essential for good learning outcomes and engaging the classroom, particularly when it comes to reducing fatigue and improving students' understanding. Naturally, our ears use directional measurement to focus our attention. For remote learners, all audio is coming from one direction, which leads to more distractions. High-quality audio reduces this negative impact.

Learning institutions will need to focus on implementing technology that strengthens collaboration for everyone, regardless of their location. All AV solutions must seamlessly integrate with high-quality conferencing platforms so at-home students aren't missing any part of the lesson. Voice lift technology, which amplifies the voices of people in one part of the room just enough so that people in other parts of the room can hear them clearly, is imperative to ensuring at-home students can hear questions and dialogue from their in-person classmates.

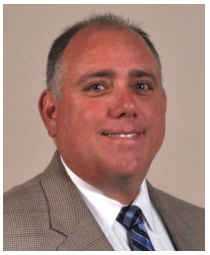
VICTORIA SANVILLE
Education Account Leader
LG Business Solutions USA

As colleges and universities across the country emerge from the COVID-19-induced issues posed over the last two years, it has become increasingly important that students and educators are given the technological resources needed to form meaningful relationships and maintain consistent learning experiences, no matter the circumstance.

More than ever, businesses operate in a world that is largely online, so exposing students to digital technologies early on makes their learning more applicable to real-world career needs and can increase their competitiveness in the workforce. For this reason, proactively integrating advanced technology into learning environments is increasingly relevant.

Manufacturers are finding that digital displays are helping universities turn small, previously unusable rooms into labs or collaboration spaces. Institutions are increasingly looking to repurpose under-utilized spaces to create areas such as computer and gaming labs for STEM pursuits including coding, telehealth training, and more. Prospective students are increasingly demanding these types of spaces, making them an equally beneficial addition for schools, educators, students, and manufacturers.

With modern technology and the right support, schools meet the needs of students and professors alike. Classrooms have the ability to easily transition between in-person and virtual, educators are able to boost learning potential and classroom creativity, and students are offered a multitude of resources to address educational needs. Working together, higher education institutions and technology companies are able to generate productive learning environments.



ROGER TAKACS
Strategic Account Manager
Atlona

Synchronous learning is now a permanent element of classroom design. This is especially true in higher education, where universities remain flexible on classroom capacity due to fluctuating pandemic conditions. Extreme weather has also prompted more schools to take advantage of their new remote capabilities, ensuring heavy snow days no longer interrupt classes.

The desire for asynchronous learning among student communities also remains strong. This means that universities still need to offer more traditional remote learning platforms over their networks, such as classroom recording, along with modern AV and UC technologies that bring physical and remote students together.

There is a tendency to think that every university will adopt the most current and advanced technologies for their latest classroom designs. However, there is still a thirst for proven AV technologies that deliver in the context of today's asynchronous and synchronous learning needs. If we look at the former, lecture capture systems remain the preferred method for classroom recording over software codecs like Zoom and Teams.

Even with increased adoption of BYOD/BYOM strategies, wireless solutions will not replace wired systems with physical inputs anytime soon. Classroom designs that bring wired and wireless technologies together with IT network infrastructure will offer the best flexibility for universities tasked with supporting diverse instructional methods. On the video side, that means providing video systems that can support three or more video sources. These should be sharable with UC and recording systems via both USB extension and BYOD platforms. On the audio side, it means bringing student microphones and speech reinforcement together with the same technologies to optimize voice intelligibility and audio quality for all. Finally, demand for PTZ and auto-tracking cameras continues to grow as universities continue their efforts to bring physical and remote learners together as equal contributors.

GINA CUNSOLO
Content Marketing and Copywriting Specialist Yamaha Unified Communications

A successful hybrid higher education classroom creates an environment that empowers educators, engages students, and enables participants to contribute from wherever they are located. The various technological components—displays, cameras, audio, control systems, and streaming functionality—must work concurrently to support the teaching pedagogy and curriculum. While unified communications look different across universities, here are a few foundational ways to prepare the higher education classroom for both now and the future:

First, it's important to remember that the hybrid classroom is here to stay. Colleges and universities must create environments that foster learning and collaboration for both in-person and remote students. For in-person participants, screens should be distributed throughout the room to allow students to see their classmates who are in the room and on the far end simultaneously. This is accomplished by positioning cameras to capture all in-person participants head on.

It's also important for all classmates to hear each other clearly. Dante-enabled ceiling microphones or wireless microphones support a variety of teaching models, from the typical one-to-many model with a teacher or trainer in the front of the class, or the many-to-many model, with breakout rooms for discussions supporting participants locally in the room and those joining remotely. In order to ensure that remote students can participate effectively, it's important to outfit students with a mobile kit that includes a state-of-the-art personal Bluetooth microphone and speakerphone, a webcam, and updated software with higher compression capabilities so applications and automations run smoothly with less bandwidth.

Finally, as classroom technology advances, it's crucial to educate the teaching staff on how to use the technology. Providing thorough training helps avoid fatigue, eliminates distractions during class, and empowers educators to optimize their delivery for the varying learning styles of their students.

HAL TRUAX
Vice President of Sales and Marketing Hall Technologies

Designing for the classroom of the future is something we've given significant thought to at Hall. If the last two years have taught us anything, it's that schools aren't equipped to truly enable teachers to provide instruction for in-person, remote, or hybrid learning environments. The keys to successful learning environments are technical solutions that can be integrated for seamless functionality. Educators need technology that will keep them connected, with a reliable and easy way to share content across multiple platforms. But it's not just the technology; it's the support and training. We noted a survey which indicated that a third of all teachers don't feel very confident using digital media services in the classroom. The same survey also found some teachers had no prior experience with K-12 digital services. Increased tech support and training will help build confidence in the teachers who must use these solutions every day. Poorly designed systems that encumber educators often result in low adoption rates and less-than-favorable outcomes.

Schools need reliable solutions with an intuitive design and function or they risk facing technical issues—widely cited as an inhibitor to students' education and a point of frustration for teachers. While hybrid learning technology alone can't solve all challenges, a reliable solution will help reduce stress, improve user experience, and, most of all, enhance education. We believe classroom technology should be intuitive and simple to use, but uncompromising in quality and functionality. It must work because teachers increasingly count on these tools as hybrid learning becomes the norm. If your technology doesn't allow teachers to reach students, then it's not serving its purpose—to expand access, remove barriers, and promote communication.

GINA SANSIVERO
VP, Marketing & Corporate Communications, AtlasIED

If two years of COVID-19 has taught us anything, it's that the modern classroom now extends beyond four walls. The learning environment of the future stretches throughout the building, across campus, and into the homes and personal spaces of students, faculty, and staff.

Future-proofing the learning experience requires the ability to deliver a continuity of information to the entire school community in real time, regardless of location. That's why it's necessary for higher education AV and IT managers to seriously consider upgrading their communications hardware and software to fulfill this objective.

The ideal solution features a messaging system to contact students and faculty wherever they are, on or off campus, indoors or outside. Visual and audio prompts should be able to reach any computer or phone, ensuring all parties are up to date in real time. Important updates might include news that a previously scheduled event is canceled; a class is set to go remote for a specific period of time; or a positive COVID-19 case was discovered, requiring classmates to test themselves to ensure campus safety.

Things can change at a moment's notice. The ability to adapt quickly, intelligently, and informatively can help drive the classroom experience into the future unimpeded and with minimal disruption.

BRIAN RETZLAFF
Solutions Engineer
Legrand | AV

Higher education instructors are often teaching in several different classrooms every day, and each of those classrooms may need to fit hybrid, HyFlex, in-person, and distance learning styles. That means flexible, easy-to-use AV systems that provide equity to ensure students have a comparable experience regardless of their location are absolutely critical. This flexibility helps meet the constantly changing requirements for current challenges as well as whatever may come next.

AV technology must be able to provide a robust experience so students have equal access to any key visual information: the teacher, the whiteboard, a demonstration, or any other part of the lesson. Cameras are a key component to achieving that capability. They enable synchronous and asynchronous remote distance learning and can do so in a variety of ways, including sensor mats, remotes, IR sensors, or artificial intelligence software.

I think tech managers would be wise to step back and evaluate what is the most effective camera solution through evidence-based research. With so much in flux, these are the perfect conditions in which to test a variety of solutions—to see how to best support the instructors at your institution, with an eye toward flexibility and equity.

JOHN KALOUKIAN
Director of Solutions and Services
Panasonic System Solutions Company of North America

If we learned anything over the last two years, it's that the higher education learning environment can change in a moment's notice. The shift to hybrid learning put a renewed focus on student engagement, and in order to succeed, created a new standard of tools and outcomes for AV and IT managers to design around. AV technology that enables professors to better connect with students—in any setting—must be prioritized.

When designing for the classroom, managers' goals should be centered on creating engaging, immersive, and consistent environments for students, faculty, and teachers, and various AV technology will help them achieve those goals. This can take form in auto tracking software that enables a camera to move with the professor, displays that provide constant information sharing throughout campus, or advanced microphones that deliver crisp audio with or without a mask on.

Research-driven teaching strategies also offer new approaches for leveraging AV technology to improve student achievement and productivity. For example, we've found that the notion of Magana Education's T3 Framework for Innovation, which is based on principles of how people learn, can be combined with equipment like advanced microphone systems, projectors, and lens technology to capture attention, improve focus, and accelerate student learning.

TOBI TUNGL
Vice President Sales, North America
Epiphan Video

These last couple years have favored higher education institutions with remote-ready video infrastructures. What the pandemic has really done, however, is illuminate the benefits of video technology in education that have been there all along.

Pre-pandemic, many colleges and universities deployed robust lecture capture systems for very good reasons. Students are big fans of lecture recordings, which make great study aids and let them catch up on lectures if they can't attend in person. Lecture capture also helps institutions accommodate students with disabilities and those who must miss class for health reasons.

Beyond lecture capture, schools can stream and record events outside the classroom. They can differentiate their course offerings with flipped and hybrid classrooms, and create new revenue streams with high-quality remote learning programs.

How can AV and IT managers equip their schools to take advantage of these present and future opportunities for video in education?

Firstly, campus video infrastructure must be easy on the end user. Overly complex video production solutions will frustrate students and faculty, and increase training times and support calls for staff. Look for intuitive solutions that offer refined user experiences.

Secondly, the video solution must be flexible. Application-specific gear has its advantages, but it's ultimately limiting and may require further investments as new opportunities arise. Favor versatile equipment that can support a broad range of applications out of the gate.

Thirdly, the infrastructure must be simple to manage. Decentralized device management can make solutions feel like a technological burden. Fleet management tools are a giant help and make it easy to deploy additional devices as demand grows.

And finally, look for solutions that are broadly compatible. Avoid those with vendor locks and any other restrictions that will limit the institution's ability to update or adapt their tech stack later.

RICK CORTEVILLE
CMO
DTEN

If there is a silver lining from the last two years, it's that students have become more adept at using collaboration tools. Rather than having to navigate remote learning on their own, many higher education institutions have invested in technology that enables and empowers their students. Now that students are starting to return to in-person learning environments, IT and AV managers can prepare for the future in three ways:

First, using an intuitive video collaboration platform like Zoom, students can learn and communicate with teachers and fellow students with ease. We've seen DTEN clients using video conferencing to tap into guidance from their mentors, without the need for them to be there in person. Additionally, these tools can connect students that are in different geographical locations—linking campuses within the same university or connecting with students at "sister" schools to collaborate on research projects or competitions.

"Digital whiteboards provide an infinite canvas for students to sketch their ideas."

— Rick Corteville, CMO, DTEN

Next, rather than having to rely on large "Do Not Erase" signs and/or taking pictures of whiteboards with one's mobile phone, there is a much easier way to capture, share, and annotate work. Digital whiteboards provide an infinite canvas for students to sketch their ideas. These whiteboard files can then be shared with other students and annotated afterwards, keeping versioning easy and ensuring that everyone's ideas are captured.

The final consideration is ease of installation and maintenance. It doesn't make sense to invest in a solution across several learning spaces if you are constantly running from one problem to another. It's important to find solutions that can be easily taken out of the box, plugged in, and they just work. Similarly, investing in products that are powered by a platform that enables centralized devices management, remote and proactive fixing of issues, and dedicated support creates peace of mind.

JOHN URBAN
Senior Product Marketing Manager
Biamp

The past two years clearly demonstrate that the future of education requires greater emphasis on permanent, high-quality AV solutions. This will require investment in more robust system designs that can provide a seamless experience, whether students are in the classroom or joining remotely.

One critical requirement is high-quality audio solutions that not only improve audio intelligibility but also feature easy installation, ease-of-use, and contactless functionality. No matter what the remote classroom model looks like, high speech intelligibility and high audio fidelity within these environments is paramount to ensuring students stay engaged. This makes flexible, high-performance microphones and loudspeakers essential. The latest ceiling microphones provide voice tracking technology that maintains consistent audio quality for remote participants regardless of where the person speaking is situated.

There will also be a need to employ modern approaches to classroom engagement. For example, Biamp's Crowd Mics, the only audience engagement tool of its kind, leverages students' smartphones as a microphone that connects with the room's loudspeakers. Students can be heard clearly from anywhere in the room without the onerous task of setting up or passing around handheld microphones.

From a network perspective, as remote learning becomes a permanent option at many schools, this will necessitate installing or improving the networked audio accordingly. Finally, regardless of the AV solution, the technology needs to blend seamlessly into the background, allowing educators to stay focused on teaching—not learning and troubleshooting AV.

MEGAN ZELLER
Senior Director of Business Development
Peerless-AV

The COVID-19 pandemic has proven the importance of flexibility in a professional environment, specifically in higher-education classrooms, and has completely changed the standard way of learning. When social distancing guidelines were first put in place, colleges and universities were forced to shift to a fully remote learning environment in a very short amount of time—something they might not have been equipped for. With ever-changing learning environments and the continuation of hybrid learning, educators must adapt their classroom setup to conduct both in-person and online learning. This change in learning practices means that AV integrators and IT managers must re-evaluate their current AV solutions to ensure they are designed to not only fit the present needs of teachers and students, but future needs as well.

When selecting technology products for the classroom, an important factor for AV and IT management to consider is flexibility. For example, in a classroom where video conferencing and virtual lessons are needed, integrated dvLED video wall systems and mobile interactive display carts allow teachers to interact with the class while on-camera, and easily view remote students lined up on the video wall. For remote students, this unique hybrid classroom allows them to view their panel of classmates, as well as the teacher and presenters. These types of AV solutions help to recreate the standard classroom or lecture room setup, all within a virtual classroom. With the help of the right technology, educators can effortlessly conduct a lesson and interact with their students while encouraging participation and engagement.

As learning environments continue to evolve for students and teachers, it's imperative that AV integrators and IT managers adapt to design versatile, integrated solutions that fit the current needs of virtual learning and anticipate the needs of future students as well.

MARTIN BODLEY
Director and Global Head of Bose Work
Bose Professional

The pandemic has proven that, with the right technology, online learning can be integrated with in-person classes. This opens up an incredible opportunity for higher education to reach more and diverse students through online learning. Hybrid learning is the modern-day equivalent of when universities first began offering evening and weekend classes to working adults more than two decades ago.

While mainstreaming a hybrid learning environment could be daunting, there are collaborative platforms that have spent the last two years leapfrogging their tech offering to make it more intuitive.

Yet, it's not as simple as hooking a laptop to a monitor, launching Zoom or Google Meet, and conducting class as normal. Remote students often struggle to clearly hear lectures and see what's written on whiteboards. This creates an inequity of experience that inhibits online students from easily participating and creating a collaborative connection with their professors and other students.

By pairing a platform like Zoom or Google Meet with today's meeting technology, you'll improve the overall experience for remote students through greater intelligibility and video intelligence. Features that provide audio exclusion zones keep the mics focused where people will be speaking while removing ambient noise, and a 4K ultra-HD zoom camera makes whiteboards readable. Many of these improvements to audio and video clarity are now aided by AI engines which behave like little movie directors, dynamically capturing just the right words and framing the important video perspectives. The days of needing to ride the remote control are soon to be over.

An all-in-one device reduces costs since AV/IT managers won't need to install separate audio and video solutions. Resources and time can be focused on supporting the educational needs of students learning both inside and outside the classroom.

JOE DA SILVA
Director of Product Marketing
Extron

One bright spot in the pandemic is the higher education community's discovery of flexible ways to reimagine student instruction through engaging online content delivery. HyFlex learning, a variation of hybrid, is now at the forefront of this new shift to flexible learning. It relies on AV technology to instruct an in-person class and simultaneously live stream to synchronous remote participants, as well as record and store the lecture for on-demand learning. Remote instruction is seamlessly incorporated through the use of robust voice amplification, USB bridging for soft conferencing, and streaming technology.

Through virtual learning, institutions fill gaps and increase the audience reach that synchronous lectures can't accommodate. Not only does this benefit students who are unable to attend in person, but the ability to control the pace of learning benefits all students through improved skills. Notably, the enhanced flexibility also meets the needs of adult learners wishing to enhance their professional skills while also balancing other responsibilities.

"Using purpose-built AV technology helps future proof institutions to equip classrooms and accommodate all learning styles."

— Joe da Silva,
Director of Product Marketing, Extron

An important aspect of the technology—streaming media processors enable instructors of any skill level to schedule the date and time to record and stream a lesson or capture it on demand. These recordings can be stored on a USB drive, network share, or enterprise video platform while simultaneously live streaming to a hosting service like YouTube or Vimeo.

While a relatively new trend, HyFlex is here to stay. By tailoring coursework to student needs, institutions can meet goals to improve student outcomes through a variety of learning options and a customizable educational experience. Using purpose-built AV technology helps future proof institutions to equip classrooms and accommodate all learning styles, today and in the future. Plus, the added flexibility could offer a surprise advantage by elevating the institution on the student's selection list.

TAFT STRICKLIN
Sales Team Manager
Just Add Power

The traditional infrastructure approach to distributing video content has been exactly that—structured, requiring long cable runs and expensive video matrixes that locked in the number of video sources and could only be distributed to specific displays. Remote is here to stay, and the definition of what that means will vary from organization to organization and evolve over time, we know that it will require AV and IT managers to consider campus-wide networking video distribution—not just single building networks—within their design.

To push out information across an entire campus requires an AV-over-IP system that is infinitely flexible in scope, size, and capability. For example, a flexible networking system will allow for the same source to be distributed to multiple huddle or small classrooms should organizations need to socially distance or limit the number of occupants in one classroom in the future. This allows managers to be agile while ensuring staff and students are well supported no matter what.

Systems also need to be prepared to support the continuous advancements and bandwidth requirements of high-quality video resolution. There is already a greater need to support higher-resolution 4K@60Hz video because organizations are using higher-quality sources across campus deployments. Flexible AV-over-IP systems can manage changing environmental, resolution, and bandwidth requirements more nimbly.

JEN SIGMUND
Senior Segment Marketing Manager, Workplace Experience Barco

Many professors and IT managers that Barco has engaged with have indicated that their institutions are shifting to support hybrid learning environments. Driven by the need to meet student expectations for flexibility in how they learn, classrooms are being modified to support asynchronous hybrid teaching where students are either attending in the classroom or are participating online in the same class at the same time.

Designing classrooms to support the adoption and use of real-time video and collaboration tools is providing faculty and students with more flexibility and choice for instruction and learning moving ahead. With limited resources for classroom support, IT departments need to deploy easy-to-use tools that allow instructors to focus on teaching and collaboration with minimal support needed from IT.

Barco has been a pioneer in providing innovative teaching and collaboration solutions for virtual classrooms and hybrid learning environments and meeting spaces.

weConnect is an instructor designed, teaching, and training solution for virtual classrooms. Barco collaborated with leading universities to develop a powerful platform that engages faculty and students in a real-time immersive learning environment.

For hybrid classrooms, Clickshare Conference provides simple content sharing and collaboration capabilities that empower instructors to launch classes or content from their laptop by simply walking into a classroom—no setup of microphones or cameras necessary. Easy, simple, and intuitive to use, Clickshare Conference enables educators and students to focus on learning and engagement.

MAGGIE BROUSSARD
Senior Manager of North America Technical Sales AMX, Harman Professional Solutions

The higher education classroom has long been an area where innovative applications of AV technologies are developed and put to practice. With the need to facilitate student engagement and cross-discipline collaboration while maximizing technological flexibility and simplifying operation for instructors, these spaces have unique requirements that the system designer must meet.

Active learning and team-based learning approaches often require that students can present content to each other and to the class. Frequently, these classrooms are engineered to have small groups of students seated together in pods. Simple-to-use AMX HydraPort table connectivity and the ability to route audio and video between each pod and the rest of the room are crucial to the effectiveness of these spaces.

Since COVID-19 arrived, demand for hybrid learning classrooms that enable students to attend in-person or online has exploded. In these applications, ensuring that both local and remote attendees receive a similar experience is of utmost importance. Multiple in-room displays provide local students a view of the educator's presentation as well as a gallery view of the remote attendees. Cameras can be used to capture images of the presenter and the local attendees, and a window processor can composite those cameras alongside the presentation for distribution to the remote participants.

AVoIP solutions like the AMX SVSI N2400 encoders, decoders, and windowing processor are ideal for these applications. Not only is the IP infrastructure cost efficient but being able to route audio and video to any network endpoint creates a more flexible solution than ever before possible. Furniture can be rearranged, or rooms can be combined to facilitate social distancing. With no centralized frame to limit the size of the AV matrix, inputs or outputs can be added as required with individual encoders or decoders, ensuring that the system can meet any future needs.

CHRIS MERTENS
Vice President of U.S. Sales, Display Division Samsung Electronics America

The pandemic has taught us how vital technology is for a successful hybrid education model in which students—both at home and in person—can connect. To achieve this, AV and IT managers should continue to invest in proven solutions to ensure they have a united and adaptable classroom setting. The best way to prepare for an uncertain future is to put connectivity at the forefront of design, with an overarching goal of promoting collaboration, creativity, and dynamic learning.

Today's students understand a hybrid world and have grown up alongside technological advancements—knowing firsthand the critical role they play in their education. Teachers have also experienced a learning curve and understand what tools they need to enhance their work. The next generation of learning begins when AV and IT managers explore all available options to make school a more inclusive experience for all parties.

Beyond interactive displays and whiteboards, this inclusive experience might include inviting specialists, professors, and other industry experts into the classroom to assist with crafting the curriculum. Additional ways classrooms can become more inclusive are through services such as translation; closed captioning for those with hearing disabilities; and gamification, which can now be offered to accelerate learning to a broader student base.

A connected classroom focuses on elevating both the student and educator experience. Today's technology can be instrumental in facilitating this, through faster communication, inspired learning, and overall greater engagement levels. In a world that has had to quickly adapt to new changes, exploring new solutions and communicating with educators is the best long-term plan, and keeping an eye on emerging trends and maintaining flexibility for those in hybrid situations is essential. The fact is that successful classrooms prioritize inclusivity, health, and connectivity, and the right solutions can help create that improved learning environment.

"A connected classroom focuses on elevating both the student and educator experience."

—Chris Mertens,
Vice President of U.S. Sales,
Display Division ,
Samsung Electronics America

MARK KNOX
VERTICAL SOLUTIONS SALES CONSULTANT
SHARP NEC DISPLAY SOLUTIONS

The best way to design the classroom that best suits current and potential future needs is to design with flexibility in mind. At a moment's notice, classes need to be able to go remote, stay in person as mandates change, or be adaptable for hybrid settings. This means the facilitator and their content is most important. From a technology standpoint, the facilitator's classroom experience, home, and office experiences need to be as close to each other as possible. In most cases, each of these setups will consist of a laptop, its power cord, and any other cords needed to share on a collaboration program. Gone are days of complicated computer-podium systems. Now, we simply need to plug in and mirror content to students. Having a reliable laptop, power cable, display, and HDMI connection is the magic setup for future proofing, and keeps things simple and streamlined across different settings. As long as the facilitator has the same flavor of connectivity in their home, office, and classroom, they should be set. Simplicity is key here, regardless of education level. One trend I also believe we will start to see more is homeschooling. In this case, a basic and straightforward setup is still key: a laptop and monitor should be available in every homeschooling setting.

DAN HOLLAND
Marketing Manager
IHSE

Plan for the unplanned. AV and IT managers have been put into a new role of managing hardware both internal and external to the classrooms. Previously, it was only necessary to provide passwords and logins for systems in localized classroom environments—typically behind several layers of security control and firewalls. Once a computer leaves the campus security perimeter, however, it becomes a much higher risk, and so preventing security breaches and protecting confidential data will be paramount.

Cyber criminals are ready now more than ever to gain access to computers and Wi-Fi devices because they know that a school's security measures may not be as robust as they typically are behind a campus network infrastructure. All users should have training that addresses desktop security, such as the importance of locking or shutting down computers and not plugging unauthorized devices into them; private wireless networks and the risks of connecting to unfamiliar ones; good password hygiene; and what to do if they suspect their device has been infected with malware.

Second, think about how instructors and students will share sources and access data. The system should be simple to set up, flexible, compatible with existing equipment, and feature maximum security. They need direct access from a remote computer without the delays and inconsistent performance experienced in most client-server setups. Sharing sources via an IP KVM system is a convenient and highly effective method of remotely connecting to an existing KVM switching infrastructure. The configuration enables a remote user to interact with all computers on a direct connect KVM infrastructure as though they were physically located close to it. The user can be given the same access rights and accessibility to all computers on the network as an associate connected directly to the KVM switch.

CHRIS KOPIN
Executive Vice President of Technology
Kramer North America

Teaching remotely at a moment's notice has been a goal of many AV and IT managers, as they think about how their classrooms and lecture halls are currently outfitted. Teaching to remote students cannot be accomplished without technology, and the selection and implementation of that technology is so critical to the experience of both parties. Of course, adding to this is the desire to select devices for today that can perform with the systems of tomorrow, but as we know, nothing is entirely future proof.

It seems every decade or so the industry goes through a transformation of technology, and today we must all be USB experts. USB has been around for years, but distance learning and the pandemic has moved it up the ladder, forcing the market to learn a new set of rules. Like video signals, it is USB's turn to up the bandwidth. Active extension products for USB have been flying off the shelves in Kramer's warehouses; in fact, anything USB has been hot. With the wide adoption of USB-C, we must remember that it's just a connector type and it does not dictate available signals, speeds, charging standards, transmission distance, and so on.

While there is plenty of technology on the market that can take what might already be in the classrooms and make it internet compatible, this is the primary technology needed for distance learning. Streaming and AVoIP are at the forefront now more than ever as these technologies are already internet friendly. While we continue to add advanced and enhanced cameras, lighting, mics, and speakers to transform our rooms to hybrid, we must always remember the users; instructors are not stage actors and actresses, but people who have a desire to impart knowledge to the masses.

TRACY BATHURST
Senior Vice President and CTO
Listen Technologies

Designing classrooms for today and the future means designing with an eye toward flexibility, adaptability, and inclusion. Where and how learning occurs can and will change in response to student and educator needs and preferences, environmental conditions, public health, et cetera. Technology and AV solutions should be multifunctional and adaptable to accommodate in-person, remote, and hybrid collaboration. They also should be inclusive.

Expect more affordable, mobile, web-based solutions that are easy for universities to install quickly and use for multiple purposes, as well as solutions that integrate easily with existing school infrastructure, are intuitive for people to use, and can be used on their personal devices.

Listen EVERYWHERE, our audio-over-Wi-Fi solution, remains popular in education environments because it is an easy, discrete way for students and educators to hear better using their own smart devices. They simply download the Listen EVERYWHERE app on their smartphones, stream classroom audio over the university Wi-Fi network, and listen to clear audio through earbuds or headphones. To increase accessibility, we recently introduced a dedicated Listen EVERYWHERE receiver for users who don't have or prefer not to use their own smart device. They can borrow the Listen EVERYWHERE receiver from a venue administrator to stream audio over Wi-Fi. When the dedicated receivers are offered with neck loops and supported with signage, the Listen EVERYWHERE solution is in full compliance with the Americans with Disabilities Act.

Listen Technologies partners and customers have found innovative ways to apply our solutions to overcome communication challenges in academic environments. We value their input and will continue to design solutions based on these insights. Being able to hear clearly, whether in person or from a distance, is essential to collaboration and learning.

"Expect more affordable, mobile, web-based solutions that are easy for universities to install."

— Tracy Bathurst,
Senior Vice President and CTO,
Listen Technologies

PETER GASPARRO
Sales Director
Konftel

In 2020, the classroom changed forever. School administrators were forced to change the way school was taught. At a moment's notice, college students were sent home and asked to learn from behind a computer screen.

This left higher education administrations in a bind: they were forced to find viable and easy solutions to deploy in the classroom, and quickly. When doing so, there were several boxes that needed to be checked.

Audio quality became critical. Higher education institutions need solutions that allow remote students to hear the lesson plan as if they are in the classroom. If a student cannot hear the lesson, remote learning is not a viable solution.

In addition to audio quality, video quality is of the utmost importance. A dynamic, high-quality camera allows teachers to move around the room and show different areas of space, including key visual assets on smart boards and whiteboards.

It's also critical that the solution is easy to use and ties all of the technology in the room together. Solutions that are difficult to use simply won't be used.

Many solutions, like Konftel's, feature a one-cable connection hub that makes it very easy for professors to walk in; plug in their laptop; and have access to the camera, audio device and secondary screen. This eliminates confusion for the educator regarding what cables need to be plugged in. The professor is then able to have their lesson plan up on screen A, with students displayed on screen B so that they can ensure remote students are engaged.

NANCY KNOWLTON
CEO
Nureva

For AV/IT managers, there are two ways to address classroom design challenges: solve for what you see today or try to imagine tomorrow's needs. As much as we might think we can foresee future needs—the rapid evolution of new and improved tools means that we simply cannot. Starting with objectives and then clearly articulating design principals instead of products is a good way to engage in the design process:

First, everything that is chosen for a system must be standards-based, meaning nothing custom. Rather, everything plugs into a system, is recognized, and just works.

Second, recognizing that change is the only constant drives one very quickly to a modular design. Rather than one behemoth system, component parts make up a system, allowing new and better components to be easily swapped in as improved performance becomes available.

Third, system design needs to be scalable so that all rooms can be outfitted. Support technicians need to know that rooms have the same equipment in the same configuration throughout an institution.

And finally, being able to centrally manage updates to software and firmware is critical when it's simply not practical to add manpower. System alerts that are automatically generated as conditions and states change are critical as well.

Once design principals are in place, it's easy to get into a regular rhythm of research, testing, and selection. Keeping abreast of new tools and technologies comes from industry events and online reading and research.

Recommendations from colleagues at other institutions can save both time and energy, provided that the full context of the choices made is also shared. It's not just higher education where new ideas emerge. Consider what businesses and other entities are evaluating and choosing as well.

KRISH RAMAKRISHNAN
Co-Founder and Chief of Innovation and Products
BlueJeans by Verizon

A hybrid learning environment allows teachers to personalize the education experience and expand the reach of services available, but it can also create more work for teachers now being tasked with spending time playing administrator and technical support expert. This minimizes the ability for teachers to think through compelling, immersive, and interactive ways to deliver the curriculum to both in-room and remote students.

The hybrid classroom requires both in-room setup and remote setup, with specialized audio, video, and course management solutions to encourage inclusivity and engagement for all participants, because both will exist simultaneously.

We've created features that focus on making the teacher a central part of the learning environment, and helping them bring their own unique style and ability to control student activity. We also work closely with our partners in higher education to ensure their classroom environments are outfitted with the tools they need to succeed in a hybrid setting.

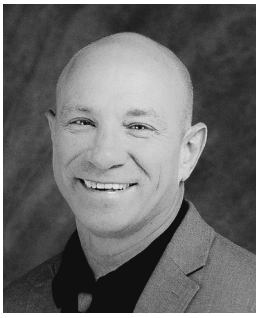
Future learning environments will need to empower instructors to easily build a custom teaching experience that is immersive and easily managed, without the overhead associated with facilitating hybrid classes. This requires simplicity in design, management, and interoperability features that allow teachers to operationalize their learning environment so they can go back to focusing on what matters most—educating students.

Designing an effective hybrid learning program comes down to flexibility and a focus on improving operations. Providing complementary synchronous and asynchronous experiences will give students the opportunity to participate and engage with course material in a way that works best for them. Ultimately, incorporating augmented and virtual reality capabilities with a specialized video platform that provides student visibility and management—and works with curriculum, attendance, and other workflow applications—will transform the education experience into one that is immersive and engaging for all.

BOB WUDECK
Senior Director of Business Development
BenQ America

Prior to the pandemic, staff and students gathered in a classroom where information was delivered using passive projectors connected to the professor's notebook. It wasn't always streamlined, but it worked for the limits of in-person instruction. The current and future higher education learning models no longer can rely on this setup. To support the continuously evolving dynamics of remote learning, instructors require active displays that connect to the cloud and enable remote collaboration directly from the screen. A cloud-enabled interactive display delivers all the features instructors need right at their fingertips, without the inconvenience and hassle of a laptop. In order for these displays to successfully power the remote classroom, however, at minimum they require integrated cloud collaboration capabilities such as screen recording, file sharing, and annotation tools. These capabilities position the display as an active ecosystem, and ensure that no matter what kind of class is being taught, anyone can interact with the display from anywhere. For example, in a calculus course, a professor can show how to solve problems directly onscreen and then invite remote users to do the same, all while recording and saving the session to the cloud.

Second, these displays need to be personalized to the instructor, with their screen preferences, cloud and network drive access, and more. Because the user will change based on who is using that classroom at any given time, personalization needs to happen quickly; that's where embedded display QR technology shines when integrated with Active Directory or Microsoft Azure. With a tap of an ID badge to log in, any display is instantaneously personalized and securely connected to an instructor's network drives and cloud accounts. As a result, teaching is effortless, and keeps pace with the evolution of current and future learning methods.



DANA COREY
Senior Vice President
Avocor

COVID-19 has taught us that class must extend beyond the four walls of a traditional classroom. Allowing students and professors the flexibility to choose between remote or in-person learning is the new norm, and higher education will need certain technologies to make this possible.

According to a UNESCO report, 1.6 billion children in 195 countries experienced remote or blended learning in 2020 as teaching moved from the classroom to a laptop device.

Decision makers understand that faculties must be able to move fluidly between remote and in-person teaching to stay productive. And it is precisely collaboration technologies that can sustain this transition, by replicating the in-person experience through video display technology, and vice versa.

Interactive displays are particularly useful because they provide touch-screen capabilities and integration with popular videoconferencing software such as Zoom and Microsoft Teams. This allows educators and students to easily connect and share ideas from wherever they are. These displays also allow students and instructors to share real-time, cloud-based annotations and analysis with everyone in a class or study group.

The acceleration of higher education's digital transformation is a great opportunity for our industry, as colleges and universities are finding new ways to connect, teach, and learn. AV and IT managers are looking to implement technologies that are platform agnostic, user friendly, and support collaboration for a future-ready, flexible learning experience.

JOHN HENKEL
Director of SMB Product Marketing
NETGEAR

There is no way to predict the future, except that we know things will change. As the famous quote by Heraclitus goes: "The only constant in life is change." Never more apparent than over the last few years—we all need to be ready for that change and try to prepare as best we can. From a networking perspective, there are several ways we can keep ourselves ready for whatever comes our way.

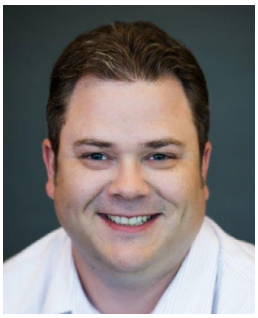
First of all, ensure the network switch has more than enough ports and uplink power than you need right now. There will only be more and more devices running over the network, so using a modular switch or being able to easily add more switches through stacking or using a simple spine and leaf architecture will allow you to expand as needed.

Using technologies like Power over Ethernet allows you to add wireless access points, encoders, decoders, and displays nearly anywhere without the need for a power drop. And so as the campus expands, you can easily expand with it by adding access points as needed with a simple Ethernet cable.

Working with a company who will work with you to design your network with the future in mind is critical. Design engineers like the ones at NETGEAR talk to a wide range of customers, and can use that knowledge to help design your AV network to accommodate future possibilities.

ROBERT DETWILER
DIRECTOR OF LED PRODUCTS
PLANAR

Flexibility and a wide range of compatibilities are important. Technology is constantly changing and the services that will be used tomorrow may not be the same as what's used today. With that, deploying AV that is flexible and can grow as a customer's needs change, or as other equipment evolves, is of critical importance. Outside of changing technology over time, the use model in a classroom can also change within a short period. For example, AV equipment may be used for a remote learning session and then be used to teach a media creation class later in the week.



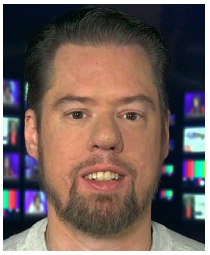
PATRICK VANTREESE
Education Sales Manager
PPDS

Simply put, hybrid learning environments are not going away. It's been made very clear that schools will still need the ability to educate students in the classroom as well as remotely even as colleges and universities return to full-time, in-person classes.

Unlike before the pandemic, the role that technology played in the classrooms has forever changed, and AV and IT managers need to keep that in mind as we move into an endemic environment. Now with the correct technology solutions, teachers are better equipped to conduct and share lesson plans—accommodating students both in and out of the classroom.

Technology is continually evolving to support the many of us who have to deal with life's curveballs at a moment's notice. Whether it's an interactive flat panel to demonstrate math problems or convey ideas; recording hardware for the live streaming and playback of lectures; or programs and software packages that allow students to view, share, and submit content online—technology is keeping campuses connected and enabling everyone to continue their education in an environment that's suitable for them.

Working with technology partners that offer a full stack of AV solutions flexible enough to securely handle any device a student may have will be very beneficial for AV and IT managers. These partners will often offer hardware and software bundles that can transform a traditional classroom into a fully equipped HyFlex learning environment, while keeping points of contact and multiple vendors to a minimum. Full-solution providers can make your project run more smoothly and efficiently, provide multiple options based on project specifications, assist with services such as installation and warranty support, and provide those introductions for direct OEM support.



STEPHEN HEYWOOD
Technology Evangelist
PTZOptics

There's now a precedent in higher education that class should continue even if campus is closed. For individuals, the expectation is that they can participate regardless of physical presence. This new paradigm requires adjustments to both classroom design and function.

I see schools moving primarily toward cloud-based assignments. The age of paper is over; students need to be able to complete, collaborate on, and submit their work from any physical location. This transition to computer-based coursework means that classrooms should be designed with power, Ethernet, and display inputs at student locations. They should have the same abilities to present and share in person as they would in a virtual setting. This isn't just about meeting the expectations established over the last two years of hybrid education—it's sound, student-centered learning.

Of course, the tradeoff is that the whole classroom is now a presentation area. If the room includes lecture capture capabilities, consider how to approach video capture so that the instructor is free to move throughout the space. Auto-tracking capabilities are one option, or, if there is a source switching option—using either a video control interface, speech-recognition system, or live video technician—multiple cameras can cover the entire space. For the best results, a multi-camera system should also be paired with a tally light system so that the instructor and students know which camera is live at any given time.

Collaboration and training among technology teams and faculty will be the key to success here. The technology must support how they teach, while also lifting the constraints of physical proximity. The average degree of tech savviness has shot up dramatically among instructors over the past two years of hybrid learning. Now is the perfect time to lay the cooperative foundation for the future.

SHAUN ROBINSON
Vice President, Product Management Xilica

The education system was thrust into unforeseen change at every level with no time to prepare. Universities reacted by purchasing webcams and USB microphones to support remote learning, but soon realized that permanent technologies were needed. Classrooms have since become more agile and adaptable, with the ability to pivot to hybrid or fully remote learning at a moment's notice. Beyond pandemic-related changes, these technologies also support student participation from other geographical areas, and facilitate remote instruction during inclement weather.

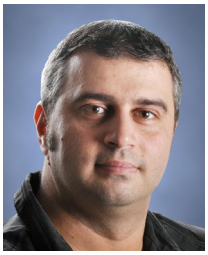
Universities soon realized these investments could modernize and improve audio inside the classroom. We now see aggressive adoption of beamforming microphone arrays that provide plenty of flexibility for both physical and remote instruction. As these are ceiling-installed systems, they capture voice from students and professors, are installed out of view, and thoroughly cover entire spaces. They also eliminate the need for wireless packs and battery changes, freeing instructors to move around. In addition, most are category cable connected and PoE powered, simplifying installation.

"We now see aggressive adoption of beamforming microphone arrays that provide plenty of flexibility."

— Shaun Robinson, Vice President, Product Management, Xilica

We see strong opportunity to merge beamforming microphone arrays with installed audio systems, the entirety of which can be installed in ceilings for even simpler system management. Xilica works with companies like Sennheiser to build compact, category cable-connected audio systems that bring microphone arrays together with DSPs and ceiling speaker systems—all of which work in harmony to acquire, process, and deliver great-sounding audio inside classrooms and to remote learners.

We also see tighter integration across audio and video systems on the horizon, particularly as we shift towards USB-C connectivity and wireless presentation for video. This will reduce complexity inside the lectern, and create more adaptable solutions for all learning environments. Xilica is simplifying classroom AV signal distribution with networked USB and Bluetooth interface devices, and we anticipate more innovation in this area moving forward.



SAMUEL RECINE
Pro AV Working Group Chair
AIMS

COVID-19 accelerated trends already well under way in AV/IT workflows in higher education: more sharing of assets; flexibility in how students and faculty can access learning and research environments; more geographic dispersion of people accessing assets and each other; and new business paradigms.

One example is "lecture capture." The root goal of this is to enrich live and on-demand access and flexibility options for students and staff. But some of the content from these video management systems has been re-bundled into certificate programs or ad-hoc courses available to non-enrolled students—effectively creating new revenue models.

Most of this growth in flexibility comes from standards such as H.264 and HEVC, which many popular assets like Zoom leverage for long-distance streaming over bandwidth-constrained networks such as the public internet.

Within facilities, high-performance AV/IT has been moving towards IP-based solutions as well.

And, while attaching more assets and more asset types to networks, and over greater distances, schools are also simultaneously strengthening their cybersecurity and privacy postures.

As universities move towards what John Kindervag tagged as "zero trust," an equally powerful market trend is that their high-performance AV-over-IP networks on campus need to move towards open standards as well.

The first wave of latency-optimized AV-over-IP products were independently developed by many brands, and while they all worked wonderfully well, they all took product-level cybersecurity responsibilities their own way. EDU now wants to design common penetration testing and audit tools and procedures across all asset types and brands in their performance AV-over-IP networks.

IPMX (Internet Protocol Media Experience) is a series of standards and technical recommendations built on top of the SMPTE ST 2110 standards evolved over the last decade. This is the next vital step to help with organizations' cybersecurity goals.

NICOLE CORBIN
Director of Product and User Experience
Utelogy Global

The remote/hybrid learning model, which has been gaining traction for the past several years, was simply accelerated by the pandemic. Two years ago, everyone was forced into remote teaching and learning, and figuring it out as they went along. Now, there's a greater level of comfort with delivering seamless online learning experiences.

Learning is no longer limited to the traditional classroom; it extends to huddle areas, labs, and student lounges on campus. These spaces all need to be technology enabled and students logging in from home need reliable, secure network connections. Delivering the necessary equipment for the "new classroom" and effectively managing its functionality can be a daunting task, especially since many schools are operating with minimal or under-staffed support teams.

Higher education institutions are being challenged to allocate their limited resources in a more targeted and efficient manner when it comes to managing their portfolio of connected devices. This goes for both new deployments and legacy systems. Simultaneously, they are realizing the importance of gaining deeper insights through in-depth analytics. Having access to such data provides a thorough understanding of device errors, equipment usage, and room utilization—giving them the insights they need to build out future learning areas.

Deploying a software-only agnostic solution such as the Utelogy platform combines IT support capabilities with a software productivity tool required for on-campus and remote management, monitoring, and room automation, as well as enhanced analytics with alerting and reporting.

With these types of solutions, AV and IT teams can remotely manage, troubleshoot and resolve activities happening throughout a campus. This enhanced ability to gain telemetry on rooms and device health is crucial to keeping students and staff happy. At the end of the day, they just want to be able to learn and teach without technology hindering the process.

BRANDON WHITE
Director of New Product Development
Vanco

The last few years have given everyone a taste of what both virtual and hybrid learning look like for students and teachers. Some may have discovered that they can work within a virtual model or a hybrid model, while others crave the in-person learning of traditional classrooms. Looking ahead, the role of AV and IT managers is only going to expand to accommodate all of the various technology needs for virtual, hybrid, and in-person education environments. As Joseph E. Aoun, president of Northeastern University recently expressed, the future of higher education will be a virtual balancing act.

With that in mind, AV and IT managers should focus on flexible collaboration solutions that are simple enough to use in any environment without having to sacrifice functionality. What I'm describing may sound like a unicorn solution, but a few key considerations will help ensure that systems are designed to meet future needs. Touchless and wireless connectivity and sharing are essential for today's modern classroom.

Given how rapidly the technology ecosystem is evolving, interoperability and ease of upgrading are also important considerations. You don't want to be locked into a single proprietary system if a really attractive new technology emerges. You also don't want to be precluded from expanding your system due to compatibility concerns. Devices that leverage widely adopted and, preferably, open standards are best. It's also essential to design all infrastructure with room to grow. You may not know yet what technologies tomorrow's classrooms will need, but you can expect that they will require network connectivity. Install the highest-bandwidth cable you can—fiber where possible—and pull extra cable for future use.

BOB KNAUF
Senior Product Marketing Manager
Poly

The last couple of years have been like nothing educators have ever experienced, or want to experience ever again. Colleges and universities, however, are more prepared than ever to take on a crisis that could put their students at risk if they are attending classes in person.

Institutions quickly learned that being flexible with how they deliver their curriculum can increase student involvement and participation, along with increased student enrollment. As classes continued virtually, attendance was running at almost 100 percent, with students joining from their dorms or apartments. In addition, international enrollments were up, as the internet proved to be a perfect location for their expansion to the global classroom.

Even with the successes we saw, getting there was not easy. There were three areas where schools ran into some growing pains:

First, some instructors and professors struggled teaching at a distance via a camera. It took training and practice to get them on track. Second, there were technology barriers. Students may have been leaving their cameras off, or they could be taking a class from a crowded apartment with lots of noise and distractions, or they were simply not being engaged. This too was a learning curve that was overcome. Lastly, just gaining student acceptance took time. Many schools saw an immediate drop in attendance as students were first overcoming technology issues and becoming disciplined enough to get to their virtual classrooms.

Everyone wants to know: what's next? Many organizations are embracing a blended model, allowing students to attend class in-person or remotely. Schools are also increasing their full-remote student enrollment, which has increased learning opportunities and additional revenue.

Schools that will succeed are those that are prepared for what comes next, set goals that are realistic, and see blended learning as an actionable plan.

"Schools are increasing their full-remote student enrollment, which has increased learning opportunities and additional revenue."

— BOB KNAUF, Senior Product Marketing Manager, Poly

CASE-IN-POINT

NEXT-GEN HIGHER ED TECH

INTEGRATED TECHNOLOGY FOR INNOVATIVE TEACHING

Georgetown University, in Washington, D.C., was founded in 1789 and is the oldest Jesuit Catholic institution of higher education in the United States. It is also among the most forward-thinking universities when it comes to applying new technology to learning.

In 2019, the CNDLS team wanted to reimagine learning spaces through collaborative technology. Working with LG Business Solutions and local technology integrator CTSI, Georgetown introduced to faculty and students a multi-dimensional classroom to support small- and large-group exploration, interactivity, distance learning, and more.

The final design includes a pair of 75-inch, 4K, interactive LG touch displays at one end of the room, a third 86-inch LG interactive 4K display at the other, and a fourth 86-inch LG 4K display on one side.

"It's not a typical classroom," explains Andy Bukowski, systems designer at CTSI. "From a professor's perspective, Georgetown wanted to have a dual-display setup that could support remote participants on one screen and presentation material on the other. They also wanted a more typical single-display system you might see in a standard classroom. And they wanted to make it so smaller groups of students could gather around several different displays, connect, and collaborate."

"Many Georgetown classrooms have a big stage, a mothership of a desk and a screen that's very clearly at the front of the room," says CNDLS managing director Molly Chehak. "We took out the stage and the desk so there is no front of the classroom. All the displays can be used by anybody in the room—instructors and students alike. They offer a collaborative space where students can work together on the same screen or multiple screens at one time—comparing, contrasting, and collaborating. In a lecture-style situation, a professor can use one or more as a confidence display, or set them up as a gallery walk."

Everything in the room is managed through a Crestron control system and touch panel, specially programmed to be as seamless as possible. With four different large-screen touch displays but only one classroom computer, that control system manages which touch display controls the computer and when.

When professors initiate a videoconference, they go to the touch panel, select Zoom; tell the system where they want the remote participants displayed and where they want the presentation displayed; pick the screen with the thumb icon, indicating which touch screen is in control; and then they're actually controlling it through the LG touchscreen display.

"Typically, a higher education learning space might have one of these configurations in a room," says Bukowksi. "But we worked with the CNDLS team and our partners to make hopping in and out of different collaboration modes very intuitive." Faculty has been quick to adopt the classroom technology. When the CTSI and LG teams visited

Photo: Courtesy LG

to familiarize users with the installed systems, the wireless Mersive collaboration pods, for example, were well received by faculty and students alike. Because users can connect to the pods from their smartphones and begin sharing content on the room's LG displays, the learning curve was very minor.

Says Chehak, "The changes we made to the classroom reflect the deep shift in pedagogy and the experience of education. It's student centered, collaboration centered, multifaceted, and needs to allow for the outside to come inside, and the inside to go outside. Technology can do that."

Photos: Courtesy Sennheiser

FUTURE PROOFING WITH TOUCHLESS AUDIO

Sennheiser, the first choice for advanced audio technology that simplifies collaboration and learning in hybrid environments, has been selected by the technology decision makers at the IDE Business School in Ecuador to drive their hybrid education setup. With support from distributor Smart Click, the IDE Business School has installed and rolled out 16 TeamConnect Ceiling 2 (TCC2) microphones for its in-person and virtual conferencing audio needs in its primary lecture halls. The ceiling microphones proved to be the ideal choice for the school, thanks to its best-in-breed technology for conferencing inside classrooms, lecture halls, and boardrooms—with many easily controllable features that make the education experience seamless for remote participants.

Before working with experts from Sennheiser and Smart Click to find the right solution, the educational institution used classic radio frequency (RF) microphones in their classrooms. This technology caused several audio problems and was not conducive to virtual environments, taking away from students' learning experience. Daniel Susaeta, general director of IDE, was tasked with solving for new challenges arising from the pandemic, particularly ensuring that the university could offer a flawless educational experience to both remote and in-person students and educators.

It was crucial for the University to find a new solution quickly to be able to shift to virtual education with limited down time. They enlisted the support of Smart Click, a business technology distributor, to help them identify the right solutions, including Sennheiser's TCC2.

"Smart Click provided the highest quality service. Their team gave us excellent demonstrations and advice on everything from audio-visual installations, acoustic treatment, and even professional lighting. They helped us facilitate a complete AV setup, in conjunction with the TCC2 from Sennheiser," said Susaeta.

"What we liked the most about Sennheiser's TCC2 microphone technology is that it is practically autonomous. We don't have to worry about manually managing the connection, gain settings or volume adjustments, and the new features like TruVoiceLift help us get extremely clean audio," said Stefany Acuña, coordinator of information and communication technologies at IDE Business School.

Sennheiser's TeamConnect Ceiling 2 proved to be the best-in-class solution for IDE Business School's hybrid learning setup. TCC2 provides students and educators with freedom of movement, and a completely contactless microphone solution that reduces potential hygiene risk—a crucial advantage in times of pandemic.

The TeamConnect Ceiling 2 enables easy setup, and a hygienic learning experience through touchless audio.

"After demonstrations, Sennheiser was the only choice for us. The students who were connected from home were able to listen in real time and with incredible lifelike sound quality, making them feel as if they were in the classroom," added Susaeta.

As IDE Business School in Ecuador continues the school year, the educators and technical team can rest assured that all students, whether they are remote or in-person, are able to get the best possible educational experience, thanks to Sennheiser's TeamConnect Ceiling 2.

Photo: Courtesy LiveU

DEDICATED WI-FI HELPS DELIVER THE NEWS

The School of Communication at Emerson College houses hands-on programs in journalism, marketing, communication studies, and communication sciences and disorders, equipping students with the curriculum and technology to thrive in the classroom and in their future careers. The journalism department has augmented its curriculum with the integration of live broadcast technology inside and outside the classroom to give students practical experiences covering breaking news, politics, sports, entertainment, and other popular beats.

Bob Murphy, assistant manager, Journalism Production Center and Jonathan Satriale, technology director, School of Communication head up the live efforts within the department. They teach students the technology that broadcasters and multimedia journalists are using every day to produce live remote shots for their newscasts and the web.

The School of Communication purchased its first LiveU unit a few years ago after meetings with LiveU at NAB. The Presidential inauguration was the first deployment of the technology, and then the school took it to Super Bowl media week. "In both instances, we were attracted to LiveU's dedicated Wi-Fi offerings as we knew both events would be highly congested. We were able to get live content back to our control room and YouTube Live by mixing LiveU's on-site private Wi-Fi with cellular signals," said Satriale.

"Students learned quickly that 'this was not a drill.' You have hard deadlines, a YouTube audience and public onlookers watching you deliver real news," added Satriale. "It was truly a live shot and it looked as if we had used a satellite or microwave truck to produce it."

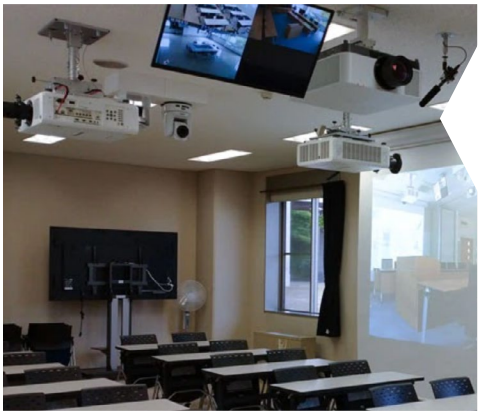
"You can't get better experience than using the real tools to cover real news," said Murphy. "During class we send our students out almost daily to do live shots, but election night coverage is one of the best examples. On election night we had reporters at all the candidates' locations with a mix of LiveU backpack and iPhones with the LiveU app."

"LiveU is regarded as one of the best-in-class cellular bonded technologies. From my perspective, it's the most widely used live shot technology out there," noted Satriale. "The company also offers onsite support and dedicated Wi-Fi at major events which is an added value."

In addition to using LiveU to cover major news and cultural events, students produce one or more live remote shots during their regular "Good Morning Emerson," "The Journalism Channel," and "Emerson Channel Sports" student-run broadcasts.

For more run-and-gun coverage around campus and around Boston, students use the LiveU Smart App. "We don't want the tools to get in the way of the journalism. It's a great, convenient way for students to have a stepping stone to go live before using the bigger equipment," noted Murphy.

And sometimes Emerson students are even on the scene before other major media. We have the capability to send the school's feeds to the local stations and networks because they are also using LiveU. It puts our students where the news is happening and on the radar of potential employers," concluded Satriale.



POWERFUL TOOLS, SIMPLE OPERATION

The Prefectural University of Hiroshima was established in its current form in 2005, after the integration of three universities in the Hiroshima Prefecture. The university has introduced an innovative and engaging remote learning solution that allows lectures to be viewed by students at three separate campuses linked by a secure VPN (Virtual Private Network).

At the heart of the solution is Sony's REA-C1000 Edge Analytics Appliance. This award-winning device uses AI technology to process and enhance video content in real time, providing additional features for immersive teaching and learning that aren't possible with conventional videoconferencing systems. Operation of the system is beautifully simple, with lecturers selecting different functions via an intuitive touch panel, without the need for complex adjustment of camera settings.

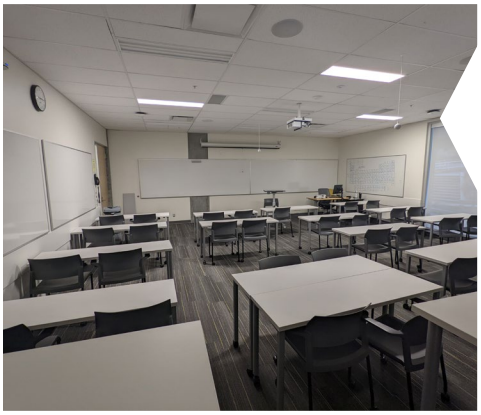
"The introduction of this system enabled distance learning with greater satisfaction, fostering a sense of unity between campuses, as well as teachers and students. We are planning to utilize this system in the future as a part of the active learning tools that our university is promoting, and provide a learning space where students can learn initiatively and actively," Kyousou Kurisu, director of public university corporation, Prefectural University of Hiroshima said.

Handwriting Extraction analyzes video footage captured with the ceiling-mounted BRC-X1000 4K PTZ remote camera, recognizing the lecturer's written notes and diagrams as they write on the board in front of the students. This extracted writing appears to float on screen, giving a clear view even for students at the back of the room or on another campus. As well as enhancing the clarity of natural writing, it also gives students a clear view of what's on the board, unobscured by the lecturer's back as they write.

Footage captured by the BRC-X1000 also allows Focus Area Cropping, with a single camera providing two simultaneous views as separate video feeds a detail-packed close up of the lecturer's expressions and gestures, together with a separate picture of the entire room.

A BRC-X400 4K PTZ camera in the lecture theater supports Close Up by Gesture, automatically zooming in under control of the REA-C1000 to capture a student when they stand up to contribute or ask a question. In addition, a compact, ceiling-mounted SRG-120DU camera at each campus captures crisp, full-HD images for web conferences or smaller seminars.

Photos: Courtesy Sony



HYFLEX LEARNING MADE EASY

Vancouver Island University is a public university located in Nanaimo, British Columbia, Canada. The university is home to over 18,000 learners and employs over 2,000 faculty and staff members. For the 2021/2022 school year, the administrative team at Vancouver Island University required that all classes fit into its new HyFlex model, giving students the option to participate face-to-face in the classroom, face-to-face via live video conference, or asynchronously through a recorded lecture.

The university's AV technicians, Jeff Egan and Sabin Ignat, knew that their classrooms were not equipped to facilitate the new HyFlex requirements and began to look for a solution. "When I was looking at different setups, the thing that I was looking for was ease of setup," said Egan. Working with local integrator Greg Johnston-Watson at Matrix Video Communications Corporation, the team chose Vaddio EasyIP products to be installed alongside their existing equipment. "The beauty of this product is the flexibility. There are other products with a range of mics, but they are a little bit pricier and not as flexible," said Ignat.

The team installed Vaddio systems in 25 classrooms in under two weeks, working with the help of a single local installer. A typical-sized classroom's standard setup is one EasyIP 10 PTZ camera, two EasyIP CeilingMIC D microphones, and an EasyIP Mixer for audio mixing and camera switching. Vaddio cameras and ceiling microphones ship with mounting hardware and cables to make ordering and installations easier. "It's just nice to have all those pieces when you order it together, especially with the mounting hardware, because when you start adding that up when you have to do it piecemeal, it just adds a lot more work and cost," said Egan.

With extra money in the budget, they added an additional camera and two additional microphones to some of the larger lecture halls. "All we had to do for that was add a couple more cables and buy a couple more mics," said Egan. Having two cameras in a classroom allows them to switch between a view of the presenter and one of the students. Additional microphones provide broader coverage of the room so that a presenter can move about freely and in-room student questions and comments can be heard clearly on recordings and live streams.

Another aspect they liked was the touch-free nature of the CeilingMICs. Previous systems included microphones that needed frequent cleaning, which caused the rubber coating to degrade over time—same with remote controls. Egan set up camera controls and presets on their Extron controllers and said, "It was super intuitive to program into our system… that was really a selling point for me."

The team used the free Vaddio Deployment Tool software download to set up and program the devices on their network. They can use the application to monitor the systems if they need to troubleshoot or make adjustments. And because they could integrate Vaddio equipment with their existing systems, instructors did not have much of a learning curve. "So often when we put stuff in, if there are any sort of issues with it, we hear about it," said Egan. "It's been great. If we're not getting any complaints about it, then that's good news."

Photos: Courtesy Vaddio

Photo: Courtesy Planar

VIDEO WALLS WITH "WOW FACTOR"

Established in 1893 and located in Missoula, the University of Montana (UM) is a public research university and a flagship institution of the Montana University System. On the main campus, the school's facilities include two large underground venues that provide spaces for instruction and presentations. These include the 400-seat Urey Lecture Hall and, located across a shared foyer, North Underground Lecture Hall, with seating for 251.

Both halls had been virtually unchanged since their construction and were in need of technology updates to raise them to levels fitting with today's expectations for higher education. Using proceeds from bond funds earmarked for investments in student-serving infrastructure, both venues were completely overhauled with modernizations that included new lighting, seating, flooring, and acoustical improvements.

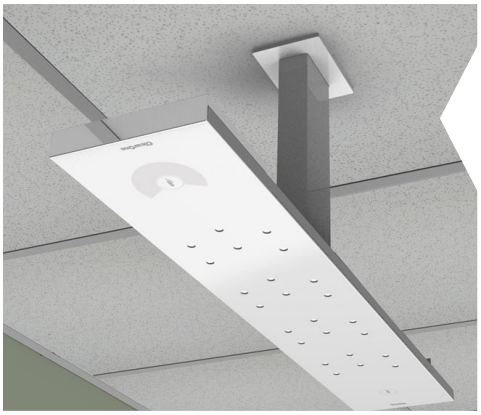
Highlighting the renovations is cutting-edge LED display technology featuring Planar TVF Series fine-pitch LED video walls. Integrated by Missoula-based Silver Stream Audio Visual, a division of Alter Enterprise, the installations include a nearly 18-foot-wide, 10-foot-high video wall in a 9x9 configuration in Urey Lecture Hall and a nearly 14-foot-wide, 8-foot-high video wall in a 7x7 configuration in North Underground Lecture Hall. Both feature a 1.8mm pixel pitch (TVF1.8).

At the start of this project, University of Montana chief information officer Zach Rossmiller tasked director of infrastructure Scott Holgate and a team of classroom technology experts with finding visual technology solutions for these often-used spaces. Knowing the rooms were used for new student orientations and recruiting events as well as instruction, the team wanted to ensure the technology would provide a degree of "wow factor" along with function. After reviewing different technologies, they settled on seamless LED video walls from Planar.

Compared with the projection equipment that previously served the rooms, the Planar TVF Series LED video walls provide abundant and clear visibility from all vantage points in the lecture halls, according to Holgate. "You can easily view them from any angle and the video walls are bright throughout," he said. "It's a tremendous improvement over what we had before. And being a seamless technology, the video walls do not have any lines that might interfere with a spreadsheet or other presentation materials."

"They can now better cater to remote participants and students who can make it to class," said Desireh Kissinger, senior AV support consultant with Silver Stream Audio Visual. "The technology upgrades were critical for bringing those rooms into the 21st century. The video walls look impressive in the spaces, and they provide more flexible options for the university and the students."

In every way, Holgate said the university is very impressed with the Planar video walls. "The durability of the product is fantastic. It's clear that a lot of great care has been taken into the design and engineering—the displays are simple to use and maintain. From a facility standpoint, when we have 250 classrooms to take care of, not adding complexity and something that's hard to manage is a huge advantage."



ENHANCING DISTANCE LEARNING COLLABORATION

Driven by a variety of market forces, distance learning is increasingly becoming a mainstay at institutions of higher education around the world, including Taif University in Saudi Arabia, which recently completed a major upgrade of its audio capabilities in partnership with Smart Cities Technologies (SCT) and ClearOne, a global market leader enabling conferencing, collaboration, and network streaming solutions.

"When it comes to distance learning at Taif, instructors use video conferencing in the lecture halls to collaborate with the undergraduate and graduate student population of Taif University's women's campus," explained Moath M Yousef, senior AV pre-sales and product manager of SCT. "And university staff members were facing many problems with the audio—mainly echo and disconnection issues."

In addition, according to Yousef, classes with many students found it very difficult to constantly move the microphone between participants so that the far end of the room could clearly hear questions and discussions. In fact, these video collaboration classes often required dedicated supervisors to be present to move the microphones between participants to ensure that classes would run smoothly.

After evaluating the situation, Yousef introduced ClearOne to Anas AlQudsi, Head of the Infrastructure Department at the university, and together they built the full design for a complete state-of-the-art collaboration solution, featuring ClearOne CONVERGE Pro 2 DSP mixers and Beamforming Mic Array 2 combinations across 27 classrooms of the campus.

Working with 2 Beamforming Mic Arrays attached to each CONVERGE Pro 2 mixer, combined with new audio-absorbing materials in the classrooms, Anas was certain there would be no future need for dedicated classroom supervisors present for all the microphone transferring between students. The entire installation was completed in less than a month — and without a hitch!

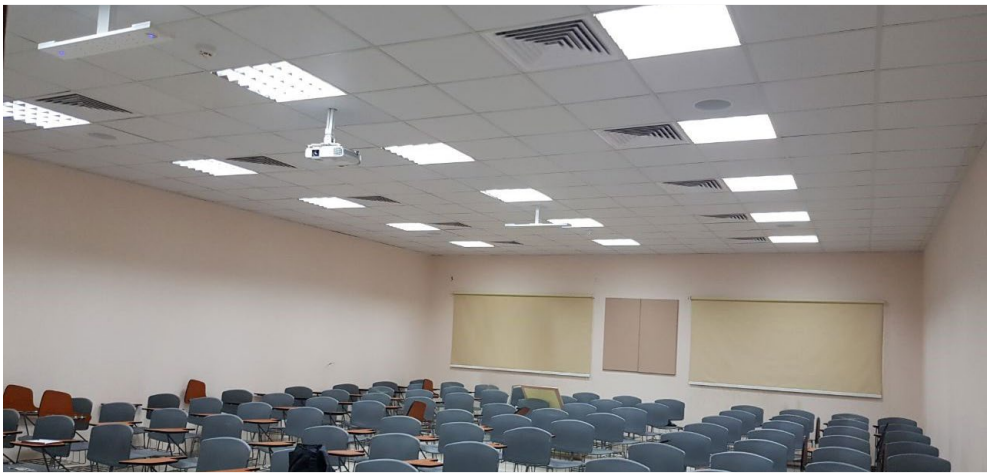
"Taif University and SCT chose ClearOne solutions based on the company's history in the audio industry and the quality and reliability of its solutions," Yousef emphasized. "ClearOne's market reputation and extended warranty further cemented our decision to partner with them."

Smart Cities Technology has a team of expert engineers with extensive experience in the field of audio-video solutions, home automation, lighting, conference room technologies, and IT solutions. Partnering with market-leading technology providers in the fields of pro AV and public address, discussion and interpretation, building, and home automation, Smart Cities Technology can offer a complete range of innovative, integrated, and high-end solutions.

"The final solution perfectly fit the needs of the university and allowed instructors to easily connect with students," explained AlQudsi. "Taif University recommends that any organization looking to deploy an AV solution should talk to SCT and ClearOne."

According to AlQudsi, instructors are using the new ClearOne solution daily, and often the instructors connect to two or three classes simultaneously, as many students are studying the same subjects. The solutions are in use at least 10 to 12 hours per day.

Taif University continually invites professionals from around the world to share knowledge with students, and all of them have found that the ClearOne solution made this quite easy to manage. From the aesthetics of the mics and the easy control with the CONVERGE Pro 2 platform, the network is quite easy for the IT team to manage. Anas said that the university is quite pleased and plans to expand the solutions across more classrooms in the future.



Photos: Courtesy ClearOne

FOSTERING A COMMUNITY SPIRIT

Located in East London, the Adult College of Barking and Dagenham has offered a wide range of adult education courses for personal development, work, and leisure for over 30 years. The community-centered college recently underwent a teaching technology upgrade, with Avocor solutions as the centerpiece of the project.

"In early 2019, we started a technology refresh project across the college, upgrading our existing hardware solutions as part of a college-wide initiative," Aujla Jagdeep, IT manager at the college, explained. "The project's aim was to give our teaching faculty the tools to make lesson content and delivery more interactive, ultimately making lessons more engaging for our student community."

Jagdeep turned to the IT service team at London-based Vanquish Technologies to assist with the college-wide upgrade: "Recommended to us by another supplier, we were immediately impressed by their approach to customer service and support. They understood the project objectives and I felt [they] made a proposal based on our needs as opposed to vendor relationships they may hold."

With Microsoft O365 rolled out across the college, Jagdeep was keen to deploy interactive solutions that could seamlessly extend the Microsoft experience from personal devices into the learning environments. He also wanted solutions that offered an open platform to work with legacy applications, in-classroom and remotely, as the desire for blended learning options increased across the college.

When the COVID pandemic hit in April 2020 it accelerated the need for remote learning, all courses moved online due to social distancing guidelines and restrictions.

"COVID-19 has, in some ways, resulted in positives for the college: we were able to introduce our digital transformation agenda a lot earlier than originally anticipated. Our Teams platform within an O365 environment has been so popular for students and teachers alike; we have been able to switch off our VLE (Virtual Learning Environment) permanently," Jagdeep explained

"Choosing Avocor displays meant that we had a solution in situ that was completely adaptable to learning requirements. The solutions are incredibly intuitive, meaning all of our teaching staff can see the benefits of delivering learning outcomes. The integration with the Microsoft suite means providing a seamless transition for students and teachers alike," Jagdeep continued. "A large percentage of our student community are learning English as a second language, but the usability of the Avocor solutions hasn't been a barrier to adoption; the students see the displays as giant iPads, and functions like edge swipe and gestures support the adoption."

Over the last nine months, lecturers at the college have witnessed benefits to their lesson content creation, as well as their ability to deliver high-impact, engaging virtual lessons. Simultaneously, students at the college haven't been isolated in terms of their learning goals and continue to develop personally—supporting the overall community spirit of the college.

Jagdeep concluded, "I am personally delighted that we chose the Avocor solutions, they have been instrumental in our ability to deliver immersive lessons for our students during this difficult time, and continue to be an important part of our digital transformation agenda."

Photos: Courtesy Avocor

THE FUTURE OF REMOTE LEARNING

The Wharton School at the University of Pennsylvania is a premiere institution for business education. Over the years, the school has sought to extend learning experiences and connect students and faculty beyond the classroom. When connecting remotely to study groups and classrooms, however, students often faced technological challenges like being unable to see faculty or difficulty sharing documents. This challenge became further pronounced when dispersed students and faculty members needed to collaborate with one another. To overcome these challenges, Wharton embraced modern, adaptable video conferencing to support a shared learning experience in every classroom.

Wharton Computing, led by CIO Dan Alig, identified the potential for bridging students with knowledge experts to improve learning in ways that hadn't previously been possible. To provide instant, on-the-go access to student resources, the IT team rolled out the BlueJeans meetings platform on iPads for all executive MBA students. This connected communities of students and faculty members, fostering an environment highly conducive to collaboration. "Education continues to evolve in ways big and small. How we bring the classroom—and what happens in it—to students everywhere is a key component of this evolution. BlueJeans is a big part of that," said Alig.

As a one-stop online course materials shop for students, Canvas, a leading learning management system (LMS), is designed to make life easier. A virtual extension of student study spaces, the Canvas integration with BlueJeans brings one-touch meetings, virtual office hours, and easily accessible lecture recordings to students anywhere. Integrating BlueJeans with Canvas provided a seamless extension for over 100 video-enabled study spaces, allowing students to collaborate as if they were in the same room.

Alig and team were quite pleased to discover BlueJeans doesn't require significant IT presence, and the integration has proven highly reliable, supporting consistent student and faculty interactions. When it comes to collaboration, adaptability and connectivity are taking hold. "BlueJeans brings the right solution to each use case at the right time. BlueJeans is an important partner," said Alig.

Bridging classroom video conferencing systems with mobile devices was made possible with BlueJeans. By reducing the friction common with other solutions, BlueJeans provides an easy way to connect people no matter where they are or how they are connecting. With a number of study groups on both the Philadelphia and San Francisco campuses, executive MBA classes use BlueJeans to meet with each other. Students also use BlueJeans to attend classes taught by professors or teaching assistants. Faculty members also host office hours using BlueJeans, allowing students to attend from anywhere. "On a daily basis, BlueJeans affects our culture. It's seamless, adaptable, and easy to use," Alig remarked.

By leveraging BlueJeans, Wharton maintains its innovative approach to enriching learning and helping faculty achieve more—whether it's in a group study space, through Canvas, or via a virtual meeting. In fact, the entire Wharton population has access to BlueJeans licenses to encourage collaboration. "It's about seeing and interacting, along with bringing the world into our classroom. That's the direction we're moving in as a global business school," noted Alig. What was once only imagined has become reality, fulfilling Wharton's vision of extending classrooms beyond the campus.

SUPPORT FOR STUDENT COLLABORATION

JMU X-Labs uses a fleet of BrightLink interactive laser displays to provide large display areas and enable content sharing, real-time collaboration, and the ability to interact with content for the lab's project-based learning approach.

JMU X-Labs at James Madison University in Virginia is an active-learning classroom in every sense of the word. Students may work on projects that involve designing autonomous vehicles or drones; or they may use VR technology to practice surgery skills or to develop a virtual tour of the campus.

To support these innovative collaborative classes, JMU X-Labs needed display technology that would allow students to share their projects with the class and interact with the content. It also needed a solution that would work for distance and hybrid learning. To get large, interactive images, JMU selected Epson's BrightLink interactive displays. The BrightLinks allow wall space in the lab to be used as an extension of students' laptops or devices. They can share their screens and interact with the content. "Collaboration is at the very heart of what we do," said Nick Swayne, JMU X-Labs founding director. "Working as teams to brainstorm, problem solve, and share ideas is critical to accomplishing our goals. We needed a display solution that would allow us to maximize our creativity. The BrightLink was the answer to our problem. With its large 100-inch display, built-in annotation tools, and network capabilities, we can easily display presentations or PC-free content, as well as use the annotation tools to create and develop ideas. Then just as easily, we can capture our sessions back to the PC-free jump drive."

JMU X-Labs set up four of the BrightLinks to display on the wall in the front of the room. Another BrightLink projects images onto a wall on the left side of the room. Students and faculty use the BrightLinks in different ways depending on the needs of their project. For team projects, each team might be assigned to one of the four BrightLinks at the front of the room to use for their work. The BrightLink's large, bright, laser light source also makes it a good fit for some of the more visual classes offered at JMU X-Labs. For example, in one class, students used it to help find bugs in a Virtual Reality program. One student wore a VR headset and projected what they were seeing onto the wall. This allowed classmates to clearly see what the student was seeing. The student could easily demonstrate the specific features of the program or show classmates if a feature wasn't working correctly.

The innovative technology in JMU X-Labs made it a sought-after space for distance and hybrid learning for other disciplines during the pandemic. The lab uses the BrightLink displays and ThinkHub collaboration software to transform an entire wall into a giant interactive touch surface that can be used in a variety of ways to support student engagement and group work. One unique example of how the space is used for hybrid learning comes from JMU's performing arts department, which used the equipment in JMU X-Labs to create virtual backgrounds and storyboards they would project onto the video wall. Then they would perform in front of the wall, interacting with the content and broadcasting their performances via Zoom to their classmates. Performing in JMU X-Labs helped students learn more about how to use technology to support their art, and also provided a great solution for distance learning.

Photo: Courtesy Epson

PRODUCTS THAT MATTER

WORKPLACE PRO AV PRODUCTS

1

2

3

1 Crestron Flex

Crestron Flex is a portfolio of videoconferencing solutions that transform any small, medium, or large classroom into a dynamic and highly collaborative learning environment. With Creston Flex, new or existing learning spaces can now be outfitted for remote participation or hybrid environments. The Crestron Flex Video Conference System Integrator Kit provides a customizable video conference solution that supports single or dual video displays and features a UC presentation transmitter, a tabletop touch screen, and a UC bracket assembly. The Crestron Flex C-Series is a perfect solution for use cases like a dual-projector classroom, a tiered classroom, an auditorium, or any complex space requiring web-based video conferencing with Zoom Rooms.

crestron.com

2 Apollo Technology Room Kit

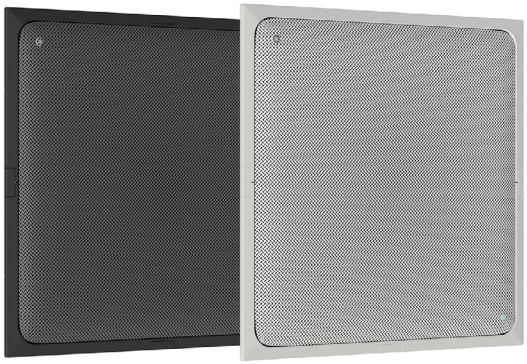
Hall Technologies' Apollo Technology Room Kit or TRK1 includes all the components needed to get a classroom up and running for both in-person and remote hybrid learning: first is the switch, which handles routing all the various media inputs and outputs for the classroom and provides amplification for the room speakers; second is the input panel, which allows for convenient connection of HDMI and USB devices as well as a simple toggle button to change sources; and finally, the kit includes a control panel, which allows the operator to easily power the room on and off, control volume, and switch sources.

halltechav.com

3 Edge Analytics

Sony's Edge Analytics solution (REA-C1000) allows users to create video content in real time, without the need for specialized training, additional staff, or equipment. The compact and lightweight Edge uses AI-based video analytics technology to analyze the input it receives from connected cameras and automatically extracts the object in focus to combine it with other images in real time. When used alongside Sony's PTZ cameras, Edge is a virtual camera operator that can elevate and capture a presentation. Additional licenses can be incorporated to enable features including handwriting extraction, PTZ auto tracking, close-up by gesture, chroma keyless CG overlay, and focus area cropping.

pro.sony



4 RM-TT and RM-CG

Yamaha's RM-TT and RM-CG tabletop and ceiling-mount microphones include automatic voice tracking, auto gain control, adaptive echo cancellation, noise reduction, and reverberation suppression for optimal collaboration experiences while seamlessly integrating with existing conferencing equipment. The Dante-enabled models' voice tracking technologies allow conversations to be picked up and delivered clearly to the far end. The RM-TT tabletop's voice tracking function automatically selects the microphone closest to the person speaking for superior voice capture, and its human voice activity detection anticipates additional voice locations for seamless conversation pickup. The RM-CG, featuring Yamaha's dynamic beam tracking, utilizes multi beams to automatically track voices within the room simultaneously.

uc.yamaha.com

5 OME-MS52W

Atlona's OME-MS52W, now-shipping, is a wired and wireless AV gateway that provides a robust switching and USB extension solution for collaborative spaces. Part of Atlona's Omega Series of presentation and collaboration solutions, the OME-MS52W features HDMI, DisplayPort, and USB-C inputs alongside mirrored or matrixed HDBaseT and HDMI outputs with selectable switching modes. All wired AV inputs and the local HDMI output support High Dynamic Range (HDR) formats and 4K/60 4:4:4 video at HDMI data rates up to 18 Gbps. Native, platform-based, wireless interfacing enables screen mirroring for iOS, Android, Mac, Chromebook, and Windows devices without the need for a separate app.

atlona.com

6 LG CreateBoard

The **LG CreateBoard** (Model TR3DJ)—available in 65-, 75-, and 86-inch models—is a series of interactive displays that helps ensure students can see what their professor is presenting. It supports virtually all learning management systems, cloud drives, and online conferencing platforms to seamlessly facilitate in-person, hybrid, or fully remote learning. LG CreateBoard displays feature IPS display panels for wide viewing angles—critical in classrooms where students may be more spread out than usual—and 4K ultra-HD resolution for presenting detailed content at a large scale. Additionally, LG CreateBoard's 20-point, multi-touch surface makes it easy to collaborate on screen.

lg.com

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7 IPX Series with iSingleWire Informacast

AtlasIED's IPX Series with iSingleWire Informacast software offers a powerful, scalable, and customizable communications solution for higher education environments. Through native integration with SingleWire InformaCast software, the mass communications capabilities of the IPX series are further extended to ensure consistent, intelligible two-way communication even in loud, acoustically challenging indoor and outdoor spaces. Recorded, live, or zoned emergency or scheduled notifications can be deployed throughout a school building, across an entire campus, and to off-site mobile devices.

atlasied.com

8 LU-Smart

LiveU's LU-Smart app represents the next level in mobile newsgathering, allowing broadcasters and online content creators to extend their coverage using their smartphone, and supporting both leading iOS and Android devices. The LU-Smart bonds internal Wi-Fi and cellular connections to reach optimal video quality.

The LU-Smart enables high-quality, low-latency, and reliable live video transmission while on the move. Users can combine available LTE and Wi-Fi networks, including the ability to support an external Mi-Fi, enabling the bonding of two cellular connections in a single smartphone. Users can bond the phones' internal LTE with external LTE for network diversity, increasing both reliability and available bandwidth.

liveu.tv

9 Absenicon 3.0

Absen's Absenicon 3.0 is an all-in-one design that integrates the control system, operation system, and sound systems inside one device. Featuring a new smart control system, the operation of Absenicon 3.0 is as easy as that of a TV. Users are able to easily turn on/off the screen, switch the digital channel, and adjust the screen brightness and the OSD menu settings remotely. Absenicon 3.0 also supports the Android 8.0 system and Windows 10, meeting customers' diverse needs. It has easy installation and maintenance, and is able to be utilized in conference rooms, houses of worship, hotels, corporate events, education, and many more applications.

absen.com

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10 Pearl Mini

Epiphan Pearl Mini delivers the flexibility to support lecture capture, online learning programs, flipped and hybrid classrooms, and other AV applications. Pearl Mini can record, stream, and switch up to three full HD video inputs from HDMI, SDI, and USB sources. The giant touch screen is great for confidence monitoring and ease of use, while direct integrations with Kaltura, Panopto, and YuJa streamline CMS workflows with automatic streaming and/or recording and file uploading.

Add Epiphan Cloud to simplify the management of multiple Pearl devices with a centralized dashboard, 24/7 monitoring and alerting, time-saving batch actions, and more.

epiphan.com

11 SmartMount Motorized Height-Adjustable Cart

The Peerless-AV SmartMount Motorized Height-Adjustable Cart is designed to safely mount, move, and store an interactive display. With the touch of a button, the SR598ML3E allows students and teachers to quickly and easily raise or lower the interactive display to their preferred height. For easy setup and storage, the rear shelf provides room for a mini PC and power strip, while the power cord can be neatly bundled and stored just below. The cart's large wall plate and locking casters provide a stable foundation for touch applications, and allow for easy maneuvering from room to room.

peerless-AV.com

12 Extron SMP

Extron SMP Streaming Media Processors are robust, worry-free recording and streaming appliances that fit easily into any workflow for both ad-hoc and scheduled activities. The purpose-built scalable SMP architecture alleviates the complexity, reliability, security, and network management burdens associated with personal computer or software-based recording tools. Designed to be flexible, customers can use SMP products with any video platform—such as Kaltura, Panopto, or YuJa—today and in the future.

extron.com

13 D7

The **DTEN D7** is an award-winning, all-in-one collaboration solution for video conferencing, and the perfect component to your hybrid learning plans. DTEN and Zoom create limitless possibilities for the hybrid classroom. Invite experts to join lectures and share their knowledge from anywhere in the world with superb audio and video quality. Create immersive learning experiences with the digital whiteboard or share content where remote and in-classroom participants can annotate in real time. DTEN technology is powerful, flexible, and simple to use, and getting started takes only minutes. Plug it in and it just works!

dten.com

14 Videobar VB1

The **Bose Videobar VB1** all-in-one USB conferencing device brings the practical simplicity and stunning clarity of Bose to every meeting, for every participant. Teams are able to be more collaborative and get more done, regardless of each member's location. Bring the Bose experience to huddle spaces and medium-sized rooms with an all-in-one solution that requires minimal setup and delivers premium audio and video performance.
The Bose Videobar VB1 uses a 4K ultra-HD camera with autoframing that allows everyone to see and understand the presenter, whiteboard, flipchart, or other in-room objects—and helps participants feel like they're together in the same space.

pro.bose.com

15 DIALOG 10 USB

ClearOne's DIALOG 10 USB is the industry's only single-channel wireless microphone system offering professional-quality audio with USB connectivity. Offering plug-and-play simplicity and wireless convenience, DIALOG 10 USB is the perfect solution for webcasting and cloud-based collaboration through Microsoft Teams, Zoom, WebEx, GoToMeeting, and other apps. Setup is a breeze with the included USB Type C cable that connects to any personal computer for audio, power, and control. With no external power source or additional audio cables required, DIALOG 10 USB is one of the easiest and fastest ways to enjoy high-quality audio in any application.

clearone.com

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16 Nureva XT

Nureva XT is a fully integrated solution for higher education, K-12, and corporate training that combines Nureva's full-room audio system with a classroom camera and value-added services. Full-room audio coverage means all voices are picked up in every inch of the classroom. The voice amplification feature lets students at the back of large classrooms hear everything clearly, while also supporting remote participants. High-definition video gives remote students the best seat in the house. Nureva XT also works with leading UC&C platforms and lecture capture software, and the solution's enhanced support services means IT staff can prevent problems before they happen.

nureva.com

17 SightLine

The **Da-Lite SightLine** answers the growing demand for aesthetically-pleasing room equipment with its new aircraft-grade cable drop screen feature. The single roller design suspension system, available with Da-Lite's Tensioned Advantage and Advantage screens, replaces the need for black drop above the projection screen. The new feature simplifies AV setups by creating space above a screen to place cameras or speakers, while its low-profile design preserves a room's architectural integrity. SightLine streamlines the ordering and installation process and future-proofs projects with a flexible cable drop distance up to 70 inches.

legrandav.com

18 Lecture Capture and Auto Tracking

Panasonic's Lecture Capture and Auto Tracking is an all-in-one, easy-to-use content and video management platform that streamlines information sharing and collaboration when recording and sharing lessons and presentations. The solution takes advantage of the facial auto tracking ability of Panasonic's PTZ cameras by combining auto tracking server bundles and lecture capture content and video management systems. With support for IP video feed and simple installation, this advanced technology enables teachers, students, and campuses to deliver engaging content while enhancing productivity and lesson planning in today's HyFlex, hybrid environments.

panasonic.com

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19 Crowd Mics

Biamp's Crowd Mics is a unique and powerful audience engagement tool that enables seamless audience participation by turning everyone's smart phone into a personal microphone. Eliminating the need to pass a microphone around the room, Crowd Mics creates a memorable, fun experience and increases engagement—perfect for presentations, lectures, panel discussions, or similar events. While moderators always maintain control over the conversation via the moderator interface, Crowd Mics Online enables bi-directional functionality between remote participants and the platform's host device, the ATOM, so students anywhere can ask questions by voice or text and participate in real-time polls via their smartphones.

biamp.com

20 VE1843

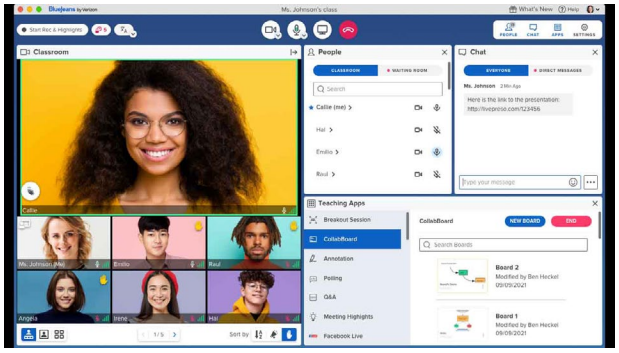
ATEN's VE1843 features the latest HDBaseT 3.0 technology. Users can easily configure the unit to be a transmitter or receiver, while enabling uncompressed True 4K HDMI transmission up to 100 meters/328 feet with zero latency via just one Cat 6A U/FTP cable. With its user-oriented hardware design and enhanced durability, it is ideal for spaces requiring long-distance, high-quality signal transmission, such as lecture halls—one of the most important facilities on any college campus. Lecturers must use the systems to simultaneously display content such as presentations or videos in a large, centralized area, which often includes multiple smaller displays mirroring content so that every student can see properly.

aten.com

21 EB-PU2220B

The **Epson EB-PU2220B** is the world's smallest and lightest 20,000-lumen projector, delivering high-powered, flexible projection. Featuring an ultra-compact black cabinet optimized for large-venue, high-brightness applications, this high-powered laser projector includes a 3G-SDI input and output to easily accommodate daisy chaining and long cable runs, plus a mechanical shutter to protect the projector. The EB-PU2220B produces ultra-bright, 20,000-lumen images and uses a 20,000-hour, virtually maintenance-free laser light source. The projector pairs with nine optional powered lenses to simplify installation and includes a host of premium features for fast setup, including built-in NFC functionality, and an optional attachable camera for multi-projector setups.

epson.com



22 VIA Campus² PLUS

Kramer's VIA Campus² PLUS is a simultaneous wired and wireless presentation and collaboration solution with a 4K60 4:4:4 HDMI input for simple and seamless wired connectivity. In the age of BYOD collaboration, the option for participants to instantly turn on their device and begin is invaluable, and VIA Campus² PLUS makes simultaneous wired and wireless presentations and collaboration effortless. Whether learning in class or remotely, users can view, edit, and comment on documents in real time and record sessions using any laptop or mobile device.

via2.kramerav.com

23 M4250 Series

NETGEAR's M4250 Series AV Line switches provide a revolutionary way to configure a network for AV over IP. The AV GUI uses a profile-based approach that greatly simplifies configuration and supports just about every possible audio and video protocol. Plus, variable mounting options allow mounting behind a monitor, under a table, or even on a truss. And PoE++ capabilities along with high-power budgets mean you can power any PoE-capable device out there. These switches truly are engineered for AV over IP.

netgear.com

24 BlueJeans Remote Learning

The **BlueJeans Remote Learning** feature pack, available as part of specific BlueJeans Meetings plans, allows instructors to build a custom teaching experience without the overhead, time, and administrative duties associated with hosting traditional online classes. By turning on the Teacher Dashboard, BlueJeans provides instructors with classroom management tools, including the ability to arrange students in gallery view, spotlight a presenter, share content, chat, and more. Also optimized for student engagement, the always-accessible chat wizard, breakout sessions, participant reactions, intelligent highlights, and multi-participant whiteboard increase opportunities for everyone to engage during a live teaching session.

bluejeans.com

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25 E Series

Avocor's E Series is available in four sizes from 55 to 86 inches; features optically bonded glass in a 4K IR interactive display format; and is ideal for applications of any size. Avocor's UiQ touch-enabled interface allows users to quickly and easily switch between a pen or finger to create a fluid, collaborative, real-time environment.

There is a wide range of connectivity options, including enhanced HDMI out that supports 4K video @60Hz, front-facing guest HDMI, USB touch, and hub connection for easy access to USB drive data, with the 55 inch also offering a Type-C connectivity option. A front-facing soundbar module provides crystal-clear 30W conference room audio quality.

avocor.com

26 C2070

The **Konftel C2070** is a video solution for higher education institutions that unites the Konftel Cam20 4K conference camera with the Konftel 70 speakerphone and its OmniSound audio quality. Konftel's OCC Hub brings everything together into one convenient kit, so a single USB cable is all professors need to connect the camera, sound unit, and room screen to the video collaboration app on their laptop.

konftel.com

27 RP02 Series

BenQ's RP02 Series interactive displays offer safety, security, and simplicity, and are designed to build an engaging and healthy teaching and learning environment. Installed with proficient cloud features including cloud whiteboard, the RP02 enhances class preparation, participation, and fosters collaboration beyond locations and platforms. The smart interactive display is also packed with advanced air-quality sensors, a germ-resistant screen, and EyeCare solutions, allowing students to learn and be engaged while staying healthy. RP02 is the ultimate interactive display to connect the entire class for a fun and seamless teaching and learning experience.

benq.com

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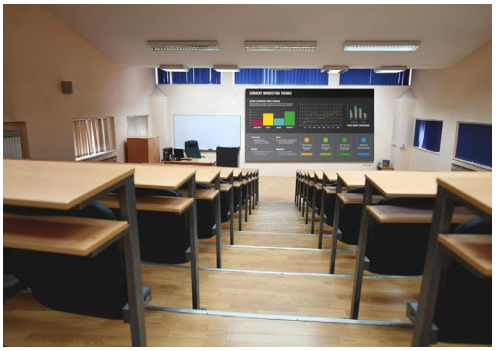

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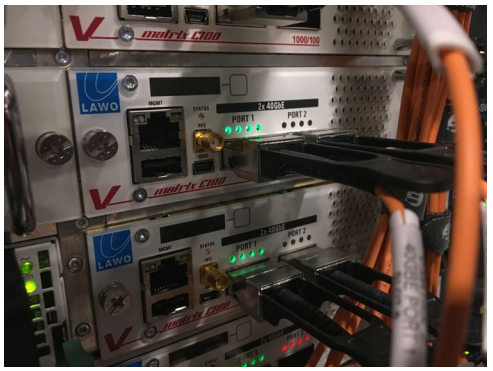

28 MGP Series

Planar's MGP Series are indoor fine-pitch LED video wall displays that offer seamless, front-service, high-resolution visual experiences at a value similar to tiled LCD video walls. Available in 1.2-, 1.5-, and 1.8-millimeter pixel pitches, the series' LED cabinets feature a 16:9 aspect ratio, enabling each pixel pitch to achieve popular full HD and 4K resolutions. Planar MGP Series is an ideal upgrade option for budget-conscious organizations such as higher education that desire to upgrade legacy projection or LCD video wall technologies. With a mounted profile of less than four inches, the solution is ADA compliant.

planar.com

29 CV355-10X

The **Marshall CV355-10X** camera is an ideal solution for higher education institutions that are capturing a range of content. It features 10x optical (12x digital) zoom block and flexible 3GSDI/HDMI simultaneous outputs with crystal-clear HD images up to 1920x1080 at 60fps. A variety of frames per second enable it to work in many workflows/applications, including virtual learning, campus events, and sports. Remote adjust and match settings include Iris, WB, Exposure, Pedestal, and others over long distances or during setup with capable auto settings that track environmental fluctuations. The CV355-10X features ultra-low-light ability and industry-leading low-noise performance.

marshall-usa.com

30 V__matrix

Lawo's V__matrix IP-broadcast core infrastructure ecosystem allows users to migrate towards a flexible, future-proof production and/or delivery environment. Its C100 processing blades accommodate a wide range of software-defined video and audio workflows and facilitate the transition to a fully IP-based environment with best-of-breed gateway functionality. Any C100 blade can be used as a gateway (vm_avp) in the morning, an up/down/cross video format converter (vm_udx) in the afternoon, and a multi-viewer mosaic generator (vm_dmv) in the evening.

lawo.com

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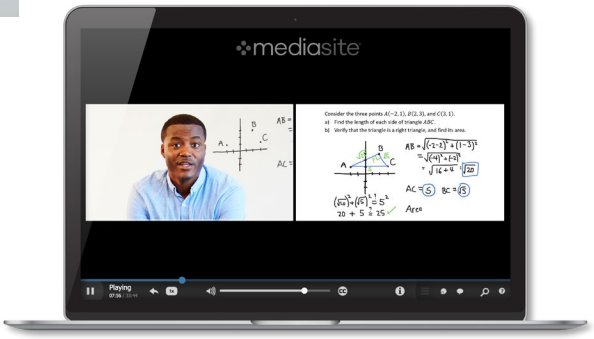

31 CAPT4K1

Vanco's CAPT4K1 is a seamless solution for the remote classroom. HDMI signals from devices can be converted for recording or live streaming. An HDMI loop out with 4K@60Hz resolution and HDR allows content monitoring on a main or local display alongside simultaneous capture on a computer. The CAPT4K1 also features a MIC input for audio to be embedded onto the signal or de-embedded for local use and monitoring with a headphone jack. With all these features, the CAPT4K1 is an ideal all-in-one solution for lecture capture, live-streaming, and playback.

vanco1.com

32 Philips T-Line

Philips T-Line are the latest line of dedicated 4K, anti-glare displays from PPDS. They have been designed to address current and future challenges in education. Available now, T-Line provides a hybrid/HyFlex solution, whether in class or at home, creating more collaborative environments for inspired and engaging teaching and learning. Students can effortlessly view, take control and record content from their seat, using their own connected device with wireless screen sharing.

Displays come with a plethora of features enabling students to design, invent, collaborate, and translate their ideas. Its i3 Technologies platform also lets tutors communicate with colleagues around the world to share ideas and even entire lesson plans.

ppds.com

33 Mediasite

Mediasite by Sonic Foundry is an all-inclusive solution enabling the classroom of the future. Mediasite gives students the quality learning experience they deserve while allowing instructors to reach all students live or on-demand, and empowering them to collaborate seamlessly. Mediasite is the best video solution for education's biggest challenges by transforming learning into an active, memorable, and engaging experience.

Learning institutions can reach a wider audience with Mediasite's lecture capture video system, making them feel more connected to campus and faculty.

With Mediasite's simple-to-use software, instructors and students can record on and upload lesson videos and assignments from any device.

mediasite.com

34 SimplTrack Lite

The **PTZOptics SimplTrack Lite** is a plug-and-play auto-tracking camera featuring built-in compatibility with most video conferencing, lecture capture, and learning management systems. Unbox the camera, plug it into a USB 2.0 connection, and start recording or streaming with motion tracking—no software setup required. The camera can also be configured with specific preset tracking zones via a simple, one-time setup process. Thanks to its 20x optical zoom that can capture subjects from up to 55 feet away, a 59.5-degree field of view, and 270 degrees of rotation—the 1080p SimplTrack Lite frees instructors to teach without limits.

ptzoptics.com

35 Sonia Ceiling Speaker Systems

Xilica's Sonia range of networked amplifiers and ceiling speakers modernizes installed audio systems for IT-friendly collaboration spaces. The series includes the Sonia C5—a compact, 5.25-inch in-ceiling speaker with a wide, even dispersion pattern that enables fewer speakers in large spaces. Sonia C5 is powered by Sonia Amp, a PoE+-enabled amplifier with integrated network switch that can power up to eight Sonia C5 speakers in a daisy chain. The Dante-enabled, plenum-rated design creates a single CatX drop to the ceiling for a full room audio system. When paired with Xilica Solaro DSPs, Xilica's VoiceMatch technology optimizes room audio and acoustics for highly intelligible speech.

xilica.com

36 PA1004UL

NEC's PA1004UL is a 10,000-lumen LCD laser projector with advanced professional installation features for higher education and corporate users. It addresses the need for higher brightness in presentation areas that are well lit or have a high amount of ambient light. A new sealed LCD cooling system developed for the PA Series installation projectors delivers a filter/maintenance-free projector while delivering almost whisper-quiet operation. With several digital inputs, connection to any computer or high-definition device is possible. The HDBaseT input and separate HDBaseT repeater provide single connections for uncompressed full HD digital video, audio, Ethernet power and various control signals.

sharpnecdisplays.us

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